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MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE,

FOR

JULY, 1870.

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MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE, STATISTICAL DIVISION,
Washington, D. C., July 19, 1870.

SIR: I herewith submit for publication the report of this division for the current month, embracing a condensed statement of the condition of the growing crops, together with a variety of extracts from the correspondence of the Department, with articles on bone fertilizers, the Alvarado beet-sugar factory, prizes for essays on agriculture, sales of Kentucky stock, receipts and shipments at Union stock yards at Chicago, the crops in Germany, San Domingo, culture of madder in Smyrna, cinchona cultivation in India, wheat culture in England, potash as a manure, wages of Irish farm labor, agricultural statistics of colonies of Great Britain, meteorological tables and notes, &c.

J. R. DODGE,
Statistician.

Hon. HORACE CAPRON,
Commissioner.

CONDITION OF CROPS IN JULY.

WHEAT.

The condition of wheat is above an average in the following States: Maine, (spring,) 3 per cent.; New Hampshire, 2; Virginia, (winter,) 1; North Carolina, 1; Georgia, 10; Alabama, 8; Tennessee, 6; West Virginia, 3; Kentucky, 3; Kansas, 2; Nebraska, 2; Oregon, 3; an average is indicated in South Carolina and Arkansas; and the following States fall below an average prospect: Vermont, (spring,) 9 per cent.; Massachusetts, 3; New York, 12; New Jersey, (winter,) 20; Pennsylvania, (winter,) 9; Delaware, 35; Maryland, 30; Mississippi, 2; Texas, 13; Missouri, 15; Illinois, (winter,) 5 and (spring,) 25; Indiana, (winter,) 10; Ohio, (winter,) 9; Michigan, 15; Wisconsin, (winter,) 15 and (spring,) 26; Minnesota, 15; Iowa, 15; California, 5; Oregon, 4.

The great wheat-growing districts all show a reduction in condition, rendering it certain that the crop of the year will be materially less than that of 1869. Future reports of condition at and after harvesting are still elements of the ultimate estimate, but the average depreciation of 13 per cent., and the diminution in breadth of about 6 per cent., would make the present estimate about 210,000,000 bushels, the decrease being at least 48,000,000.

In New Jersey a change for the worse came with the hot, moist weather of June. Much of the crop was blighted in Burlington County, and foggy weather on the sea-coast wrought great injury.

Some unevenness of yield appears in Pennsylvania; one-third of the crop in Union County has been destroyed by hail; rust and weevil were injurious in Montgomery; storms beat down the grain in Lehigh; the weevil did some damage in Luzerne. Late wheat was more injured by heavy rains than that which was sown early.

From Delaware and Maryland serious complaints of winter-killing were received, followed by fine growth in April and May, and the prevalence of rust, scab, and blight in June, after a long season of east winds and foggy or rainy weather.

Late wheat was injured slightly by heavy rains, and in places by rust in Virginia and the Carolinas, but the crop as a whole is excellent in quality and large in quantity. In Georgia this crop is regarded as one of the best ever known; in Clayton County, the best harvested in twenty years; in Columbia, the best raised in ten years; in Newton, "equal to any crop before grown." Alabama was equally fortunate; and a fair yield on a narrow breadth sown was obtained in Mississippi. Wheat sustained injury in Texas from wet weather in the Red River Valley, and in more southern counties from drought.

A large yield is reported in many portions of Kentucky; in Russell County twenty per cent. more than last year; the June rains damaged the crop in Boyle and Nelson; it was greatly injured by smut in Butler; the fly and rust were injurious in Shelby; drought in May impaired the vitality of the plant in Greenup; the midge destroyed many fields in Scott. A fair averge exists in Kentucky, as a whole, in quality and quantity.

In Missouri, on the upland, the wheat is thin, and the straw short, but the kernel is generally plump, well matured, and heavy. On the Mississippi bottoms, as in Lewis, there has scarcely ever been a better crop, while on adjoining upland prairies it was in many cases worthless, and the fields given up to other crops.

The reports from Illinois indicate a short crop of excellent quality. As specimens, Perry returns "less than an average yield per acre, but the quality enough above the average to make a full crop;" Stephenson expects about two-thirds of a crop in quantity; "thin on the ground" in Alexander; "quality superior" in Fayette; in St. Clair, "although thin on the ground, the grain is perfect;" in Marshall County, where little rain has fallen in three months, the straw of winter wheat is short and the heads long, and spring wheat is thin but the kernel is good; one-third less acreage reduces the quantity in Bureau; the quality is so much better than usual in Stark, that an average crop is expected; "large and well filled on thinly set plants" is reported of Jersey; in Hancock, as good as last year, but less in acreage; in Williamson, "a good yield, free from smut or rust;" in Randolph, two-thirds of a crop of good quality. The injury by drought, if not severe, is quite general in this State.

The tenor of Indiana returns is similar, with somewhat less of the despondent element. The returns are more variable in character than those of Illinois. In some counties, as Randolph and Delaware, but half a crop is expected, while in Bartholomew the claim is for "a full average, as compared with the last five years, in quantity, and above the average in quality," and in Vanderburg "the yield is fully one-tenth above the usual average." The fly committed some depredations in Morrison, and a few fields "were injured by the midge" in Washington.

In Ohio some complaint of thin stand prevails, with the same indications of heavy heading and soundness of kernel. "A short crop of excellent quality" would be a brief summary of the returns of this State.

The quality of Michigan wheat is superior, with a reduction in yield of 15 per cent. It rusted so badly in Lenawee County that much of it is barely worth cutting. Livingston shows a fine plump kernel with only six-tenths of the usual quantity. Winter grain in Sanilac has also done badly.

The high fame of Wisconsin wheat fields is somewhat tarnished this year. "Not more than half a crop" is reported from Columbia County; "spring wheat almost a failure" in Walworth; in some parts of Eau Claire "an entire failure;" in Sheboygan "winter wheat is filling well, spring strong and heavy." The drought has been very injurious in this State.

Iowa has suffered from dry weather, yet in a less degree than other great centers of wheat production. The prevailing characteristics of thin setting, low heading, and heavy filling are noticed here as elsewhere. In Marshall County early sown fields are doing well; late sown "almost a failure;" in Montgomery County "there will be an average crop, about fifteen bushels to the acre;" in Winnebago, wheat sown on new ground is poor and suffering from rain, while that upon old ground with deeper and more thoroughly pulverized soil is doing well. The complaint of great heat and long-continued drought is universal. There is no complaint of blight, smut, scab, rust, fly, or chinch-bug.

Kansas, formerly stigmatized as a desert, perfects an average crop of superior quality in a year of general drought. "A large yield, heavier than for years past," is reported from Doniphan; "an extra crop as to quality and quantity in Coffey." The crop in Osage is injured from the effects of severe frost in March.

In Nebraska spring wheat is looking well, but winter grain is not flourishing.

In Oregon and California there will be some reduction in quantity, but the quality will be superior. In Contra Costa County, California, unexampled destruction by squirrels is represented. The local journal estimates the loss at one-eighth of the crop, valued at $100,000.

CORN.

The increase in the breadth of corn is greater than the decrease in acreage of wheat. It may be placed at 5 per cent., or about 1,750,000 acres. There appears to be a very slight increase in New England; about 2 per cent. in the Middle States; a decrease in the cotton States, east of the Mississippi; an advance of 7 or 8 per cent. in Southern States west of the Mississippi, and a still larger increase in the heart of the west. It is estimated at 10 per cent. in Illinois, 10 in Indiana, 5 in Ohio, 2 in Michigan, 8 in Wisconsin, 20 in Minnesota, 15 in Iowa, 25 in Nebraska, and 15 in Kansas.

In condition this crop is above an average in almost every Western State. Nebraska is a decided exception. The New England and the Middle States present very uniform returns, full of high promise for this crop. In some cases, as in Columbia and Orleans, New York, the prospect is better than for several years. In the Carolinas wet weather has affected the appearance of corn, and prevented its cultivation and the destruction of grass and weeds. In the other cotton States the crop is vigorous, of good color, and fine promise. In parts of Alabama it is less advanced than usual. In Monroe, Mississippi, corn has been drowned out on low lands by excess of rain, and some of it replanted. Growth is at some points in Mississippi and Arkansas somewhat obstructed by grass, in consequence of wet weather; while in Claiborne County, Mississippi, drought threatens to shorten the crop.

Throughout the West the indications of a good crop have never been so general since the inauguration of official crop returns. "Never so many acres of fine corn in the county," as reported of McDonough, Illinois, would be a fair report of many a county in all the great corn-producing States. A few exceptions are reported. The effects of drought are lamented in Knox, Grundy, and Jo Daviess, Illinois; in Clay, Missouri, and in Jefferson, where corn "is tasseling out, and not a foot high;" in Page, Benton, and Appanoose, Iowa. "A poor stand and unpromising appearance" is reported in Riley, Kansas. In White, Indiana, the crop is represented as almost a total failure. Cut-worms, in Highland, Ohio, have almost entirely destroyed many fields.

COTTON.

The increase of acreage of cotton, as indicated by the returns of county correspondents, averages 12 per cent., and aggregates nearly a million of acres. It is almost literally true that "the people are devoting all their energies to the culture of cotton." The condition of the crop is so far favorable for a good yield—fully an average in Georgia, Alabama, Louisiana, and Arkansas; slightly below an average in the Carolinas, Florida, Mississippi, Texas, and Tennessee. North Carolina had a surplus of rain in June, which in places has occasioned injury, especially in the counties of Martin, Carteret, Edgecomb, Hertford, Beaufort, Greene, Rowan, and Mecklenburg. The plant is late and small in parts of South Carolina, but thrifty, growing rapidly in recent favorable weather. To defective seed or drought in planting time, a bad stand is attributed in many places, and growth has been retarded by excessive rain. Heavy rains in Georgia have done some damage. In Clayton and Spaulding Counties fields have been badly infested with lice, which threaten failure in some instances. To the influence of commercial fertilizers is attributed the promising appearance of the plant in many fields. In Alabama the crop is generally flourishing, though local reports are quite variable. Complaint of injuries from hail or rain storms are reported in Dallas, Macon, and Etowah, and from lice in Sumter and Randolph. While the crop is reported as backward in some counties, it is "two weeks in advance of last season" in Conecuh. In Mississippi heavy rains and cool nights have proved unfavorable in the counties of Neshoba, Washington, De Soto, Yalabusha, and La Fayette. Lice are reported in De Soto and La Fayette. Heavy rains, more favorable for the growth of grass than of cotton, and obstructive of clean culture, have been injurious in Arkansas. In the Red River region of Texas cotton is generally flourishing, with some injury from lice.

Neither the caterpillar nor boll-worm has appeared, and there are few drawbacks which a few weeks of favorable weather cannot repair. With an average season the present acreage should give nearly three and a half millions of bales; with one of the extraordinary length of the last, the product would be little short of four millions—which was of so remarkable a character for continued growth and late picking that our October estimate, a reasonable one at the time, of 2,700,000 bales, was advanced at the close of the season to 3,000,000.

OATS.

This crop is looking better than would be expected in view of the heat and drought of the season. Its condition is a full average in about

half the States, including all of New England, (except Vermont,) New Jersey, Pennsylvania, Maryland, Virginia, North Carolina, Alabama, Mississippi, Arkansas, Tennessee, West Virginia, Kentucky, and Oregon; it is less promising in New York, South Carolina, Georgia, Florida, Texas, and all the Western States, in which the deficit ranges from 9 to 23 per cent. During the season of growth there was abundant rain on the Atlantic coast between New Jersey and North Carolina, and throughout the mountain section of the South, and on the Alleghanian plateau. In the Ohio Valley drought and heat have proved injurious. The quality will generally be very good.

TOBACCO.

There is an increase of acreage in Virginia and Kentucky. Our returns show an aggregate increase of about 5 per cent. A slight decrease is indicated in Ohio, Indiana, and Missouri. The appearance of the crop is superior in Kentucky, Virginia, North Carolina, and Georgia. Drought has injured it on the north side of the Ohio.

FRUITS.

The prospect for apples is unusually good from Maine to Georgia, except in Pennsylvania and Maryland; and Tennessee is the only interior State which can claim an average. In Pennsylvania much complaint is made of premature falling from the trees.

Peaches are somewhat less abundant than apples. The prospect in New Jersey is returned at 2 per cent. above an average. Delaware will not have a full yield. Kent County reports but half a crop. Illinois is placed at 5 per cent. below an average, and Michigan at 10. Peaches and other fruits were destroyed by frost in March throughout the Gulf States. Grapes generally promise remarkably well. A full average is indicated in California, Missouri, and Ohio, and very few States make unfavorable returns.

The apple and peach crops are greatly infested by insects in the Middle States.

Table showing the condition of the crops, &c., on the 1st day of July, 1870.

STATES.	CORN.		WHEAT.		RYE.		OATS.	BARLEY.		PASTURE.	CLOVER.	TIM'THY	POTATOES, (Solanum tuberosum)		POTATOES, (Batatas edulis.)	
	Acreage compared with last year.	Average condition, July 1.	Average condition of winter wheat, July 1.	Average condition of spring wheat, July 1.	Average condition of winter rye, July 1.	Average condition of spring rye, July 1.	Average condition, July 1.	Average condition of winter barley, July 1.	Average condition of spring barley, July 1.	Average condition, July 1.	Average condition, July 1.	Average condition, July 1.	Acreage compared with last year.	Average condition, July 1.	Acreage compared with last year.	Average condition, July 1.
Maine	10.3	11	10.2	10.3	10.5	10.3	10.9	.....	10.6	9.2	8.5	8.6	9.5	10.3	.....	.....
New Hampshire	10	10.8	10.3	10.2	10.3	10.3	10	.....	10.3	9.7	9.5	9.2	10	10	.....	.....
Vermont	10.4	11	9.7	9.1	8.5	9.5	9.1	.....	9.2	9.7	8.7	8.5	9.2	10	.....	.....
Massachusetts	9.8	10.1	10.1	9.7	10.1	10.1	10.3	9.6	10.1	10.5	10.4	9.7	10.5	10.6	.....	.....
Rhode Island	10	11	.....	.....	10	10	10.5	.....	11	11	11	10.5	9.5	10.5	.....	.....
Connecticut	9.8	10.8	9.5	.....	10.2	.....	10.4	.....	10	10.4	9.8	9	8.7	9.8	.....	.....
New York	10.2	10.8	8.9	8.8	8.7	9.2	9.2	8.8	8.7	8.7	8.5	8.2	9.1	9.4	8.6	7.8
New Jersey	10.3	10.1	8	.....	9.1	.....	10.3	.....	.....	10.4	10.3	10.2	9.2	10	10	9.9
Pennsylvania	10.2	10.3	9.1	9.9	8.7	9.5	10.5	10	10.4	10.6	10.6	10.4	9.3	10	9.6	9.5
Delaware	10	10	6.5	.....	.....	.....	8	.....	.....	10	10	10	9	10	10	10
Maryland	10	8.9	7	.....	9	.....	10.8	11	.....	11.3	11	11.2	8.6	9.8	9.3	10
Virginia	10.5	9.9	10.1	.....	10.1	.....	10.8	.....	.....	11	11.1	11.3	9.9	10.9	10	10.2
North Carolina	9.5	9.6	10.1	.....	9.7	.....	10.9	.....	.....	11	10.9	10.9	10	10.6	9.7	10.1
South Carolina	9.7	9.6	10	.....	10.2	.....	9	.....	.....	10	8.3	.....	9.5	9	10	10
Georgia	9.9	10.8	11	.....	10.6	.....	9.7	9.9	.....	10.4	10.4	11	10.1	9.8	10	10.1
Florida	10.7	11	.....	.....	10	.....	9.2	.....	.....	10.8	.....	.....	9.5	7.6	10.2	10.2
Alabama	9.3	10.4	10.8	.....	10.2	.....	10.7	5.4	.....	10.7	10.6	.....	10.5	9.5	9.7	9.7
Mississippi	9.9	10.5	9.8	.....	9.8	.....	10.7	.....	.....	11.9	11	.....	10.5	10	10	10.4
Louisiana	10.7	10.6	.....	.....	.....	.....	10	.....	.....	10.4	.....	.....	10.1	10.1	9.8	9.8
Texas	10.7	10.3	8.7	.....	9.6	.....	9.6	9.3	.....	10.8	.....	.....	10.9	9	9.4	9.3
Arkansas	10.9	11	10	.....	10	.....	10.7	.....	.....	10	9.5	10	10.6	10.3	10	10.1
Tennessee	10.3	10.1	10.6	.....	10	.....	11.6	10	.....	11.3	11.3	11	10.6	11	9.9	10.1
West Virginia	10.7	10.5	10.3	.....	9.6	.....	10.5	10	.....	11.5	11	11	10.3	10.3	10.3	9.8
Kentucky	10.4	10.5	10.3	.....	10.4	.....	11.1	10.2	.....	11.5	11.1	10.6	10.5	11.2	9.7	9.8
Missouri	11.5	10.7	8.5	8.3	9.4	8.8	7.7	9.4	9.2	8	8.3	7.4	9.9	9.2	9.8	9.2
Illinois	11	10.6	9.5	7.5	9.3	9.5	8.5	10	8	7.6	8.6	7.1	9.7.	9.1	9.7	9.6
Indiana	11	10.5	9	9.5	9.5	10.5	8.7	9.4	8.7	9.1	9.3	8	9.1	9.4	9.8	9.7
Ohio	10.5	10	9.1	10	9.5	9.6	9	9.2	9	9.8	9.8	8.4	9.3	10.1	9.4	9.5
Michigan	10.2	10.3	8.5	8.5	9.2	9.6	9.5	9.6	9.1	8.9	8.4	8.8	9.2	9.2	.....	.....
Wisconsin	10.8	10.5	8.5	7.4	8.1	9	8	9.8	8.4	7.2	8	7.1	9.4	8.8	.....	.....
Minnesota	12	10.6	10	8.5	10	.....	8.5	9	9.2	9.3	9.2	9.3	10.3	9.4	.....	.....
Iowa	11.5	10.5	9.1	8.5	10	9.1	9	8.8	9.6	7.7	7.5	7.5	9.9	9.1	9.8	9
Kansas	11.5	10	10.2	9.4	10.3	9	8.8	7.4	8.4	9.3	10.1	10.4	10.3	9.7	10.9	9.8
Nebraska	12.5	8.1	10.2	8.7	9.2	9.6	8.4	.....	8.6	8.7	9.6	8.5	10.1	9.1	10.2	10.2
California	10	9.7	9.6	9.5	9.2	10	9.1	9.3	9.3	8.8	8.6	10.3	10.1	9.4	10.2	10
Oregon	9.7	9.8	10.3	9.6	10	.....	10.3	10.4	9.5	11.7	11	10.4	10.7	12	.....	.....

Table showing the condition of the crops, &c.—Continued.

STATES.	BEANS.		SORGHUM.		SUGAR CANE. (Not sorghum.)		TOBACCO.		COTTON.		WOOL.	APPLES.	PEACH'S	GRAPES.	STRAW-BER'IES.	CRAN-BER'IES.
	Acreage compared with last year.	Average condition, July 1.	Acreage compared with last year.	Average condition, July 1.	Acreage compared with last year.	Average condition, July 1.	Acreage compared with last year.	Average condition, July 1.	Acreage compared with last year.	Average condition, July 1.	Am't of wool, *in tenths*, comp'd with last year.	Average condition, July 1.	Average condition, July 1.	Average condition, July 1.	Product compared with last year.	Average condition, July 1.
Maine	10	10.3									9	12.2		10.4	9.7	9
New Hampshire	10.3	10.2									9	12		10	12.5	9
Vermont	9.4	10									8.7	10.7	11	10	12.6	
Massachusetts	10	10.1									9.2	12	12.2	11	10	9
Rhode Island	10	10									10	10.5	10	10	10	
Connecticut	10	10.2					10.7	10.2			9.6	12	10.6	10.8	10.6	10
New York	9.8	9.7					9	8.5			9	10.6	10.5	10.1	8.8	10
New Jersey	9.7	10.2									9.9	11	10.2	10	8.5	9.4
Pennsylvania	9.8	10.3	8.2	9.7			10.2	10.1			9.1	9	9.2	9.7	9.2	10
Delaware	10	11	8	10							10	12	5	6	12	
Maryland	10	9.6	8.5	9.5			10.6	9.6			9.9	9.2	9.6	9.7	9.5	
Virginia	10.6	10.2	8.4	9.8			10.5	10.5			10	11	9.9	10.9	10	
North Carolina	10.2	10.3	8.5	9.2			10.9	10.3	10.8	9.4	9.5	10.6	9.5	9.8	11.7	10
South Carolina	10	9.1	9.1	8.7			10.6	9	10.5	9.6	10.8	10.5	8.1	12.5	8	
Georgia	9.8	10.3	9.4	10.3	9.8	10.3	11.6	11.6	10.7	10.1	9.1	10	8.5	9.8	9	
Florida	10	9.5			11.5	10.8	8.7	7.5	10.7	9.8	9.6	7.5	8.4	10.3		
Alabama	10.5	10.2	8.7	9.3	10.7	10	10.5	10.5	11.3	10.2	9.3	8.2	5.7	9.5	8.1	
Mississippi	11	10.3	9.2	10	11	11	10	9.5	11.2	9.5	10.2	9.2	5.5	9.1	11.1	
Louisiana					11.5	11.1	8.3	9.6	12	10.1	6.6	9	7.1	12	11.4	
Texas	10.2	10	9	9	12.5	9.3	9.3	9.7	12.5	9.7	9.2	8.6	3.6	8.6	11.2	
Arkansas	10.3	10.3	10	11			10.4	10.2	11	10.1	10.5	8	3.1	7.7	10.7	
Tennessee	10.5	10.9	10.1	10.3			10.4	10.4	10.5	8.5	10.3	10.7	8.7	9.5	9	
West Virginia	10.3	10.3	9.3	9.8			10.7	10.2			9.8	8.5	8	10.4	11	
Kentucky	10.4	10.4	8.6	9.5			11	11			9.6	10.3	9	10.7	10.7	
Missouri	10.2	9.2	9	9.1			9.5	9	10	9	9.9	6	6.5	10	7.4	
Illinois	9.6	9.4	9	9.6			10.2	9.8			8.7	9	9.5	10.1	7.7	
Indiana	10.1	9.9	9.2	9.8			9.2	9.5			9	7	8.5	10	7.7	
Ohio	9.5	10.1	8.9	9.2			9.9	9.5			8	7.8	7.8	10	7.9	
Michigan	10	9.9	7.7	9.5							8.9	9.4	9	9.1	8.5	9.2
Wisconsin	9.5	9	8.2	10			8.4	8.4			9.7	7.6		9.8	7.7	9.3
Minnesota	10.5	10	8	11.5							10	9.4		8.4	8.6	
Iowa	10.2	9.5	9.1	10							8.5	6.9	7.8	9.5	6.2	
Kansas	10.9	10.1	9.9	9.2							10	7.7	9.8	10	9.5	
Nebraska	10.8	9.1	9.8	8.3							10.6	7.5	10	10.6	8.7	
California	9.8	9.5									11.1	8.7	9	10	10.1	
Oregon	9.9	10.1					10.2	10.5			10.3	8.3	8.6	9.8	10.7	

EXTRACTS FROM CORRESPONDENCE.

DEPARTMENT SEEDS.

Mendocino County, Cal.—One year ago last spring, or late in the winter, I received from you a small quantity of the white and of the black Schonen oats, and some barley. I planted them soon after receiving them, but neither variety matured—growing not more than twelve or fifteen inches in height. Not fully satisfied with the experiment, I determined to leave the ground unoccupied and see what a volunteer crop would do. The white oats did not seed the land sufficiently thick to prevent the weeds from overrunning most of the ground; still, some spots produced excellent crops. The barley also failed to get a good footing on a portion of the ground, but other portions were well seeded. This barley is low, and the heads of middling length, but well filled. Of the black Schonen oats, however, I have a more encouraging account to give. I had it cut to-day, and think I never saw a finer crop of oats taken from any ground. The heads are large, the grain abundant and very firm, and grows to a height I have never before seen. I think one-half the stalks would measure, from the ground up, six and one-half feet, and none of them were short. The conclusions I have arrived at are these: This variety of grain will not mature in our dry summer unless it has the advantage of early sowing, so that the roots may become strong during the winter. I believe it possesses one quality which should recommend it to all California farmers. There is a great deal of grain—wheat, oats, and barley—sown in this State expressly for hay. I have never seen a crop of any kind of grain offer so fair a prospect for a hay crop as this did in the haying season. I am confident that it would have produced hay at the rate of four to five tons to the acre, and that of an unexceptionable quality.

A year ago last fall you sent me one peck of Talavera wheat. As I was then engaged in other business, and gave but little attention to my farm, I let all go to various hands except one quart, which I planted myself. My success that year was only middling, though the heads and grain were unusually large and healthy; but I carefully gathered the product and planted it last fall. I have not yet harvested it, but the apparent result is superior to anything I ever saw on a large scale. It covers about one-quarter acre, stands near five feet high, and the heads vary from four to five inches in length. The straw, chaff, and grain are of a light color, and the grain unusually large. Its flouring quality of course I do not know. Altogether, I believe its introduction among us would be a vast improvement on our old varieties. I believe, however, that my little crop is all that is to be found in the county, the other having been allowed to go to waste and mix with other varieties. I shall probably be able to save seven or eight bushels.

In the quart of Talavera wheat I planted a year ago last fall, I found, when harvesting it, that two grains of an entirely different variety had found their way into it. Something over thirty stalks grew from the two grains. It has a short stalk, growing, in good ground, from two and a half to three and a half feet high; red chaff and red grain, but when crushed gives evidence of superior whiteness and fineness of flour. I carefully saved the seed from these few stalks, planted them, and they are now just ripening. The heads vary from two and a half to three and a half inches in length, the grains stand at right angles with the stalk, and are more closely compact than any other wheat I remember to have seen. The heads somewhat resemble the club-head wheat, but

the difference is sufficiently plain to attract the notice of even a careless observer. I have some reason to believe it is a more valuable grain for this climate than even the Talavera. I shall have about fifty pounds of it.

Buckingham County, Va.—The package of Arnautka spring wheat received from the Department of Agriculture is looking remarkably well, and promises a good yield; but for its long, turkey gobbler-like beard I think it would become a very popular wheat with a considerable portion of our population. We have a large number of migratory tenants, who usually remove to their new homes in the fall, when it is too late to sow winter wheat. They are pleased at the idea of my introducing a new variety of wheat, of which they can raise their own flour in a few months of the same year.

Princess Anne County, Va.—The Schonen oats are superior to any ever grown in this county. I hope to save them in good order, and will report results.

HOPS.

Juneau County, Wis.—Hops are quite extensively grown in this county. The crop is light compared with last year; the vine has been injured by the hop worm, comparatively a new enemy to hops in this section. One-half of an average crop is all that can be expected this harvest.

Richland County, Wis.—Hops in this county have been very badly injured by grubs. There will not be over one-half a crop this year.

FLAX.

Lafayette County, Wis.—Flax is raised in this county to a great extent, and is considered quite remunerative. The seed is worth about $2 per bushel, and the straw $8 per ton. The yield of seed is about 10 bushels per acre.

Polk County, Oregon.—Flax grows well in this county, and is considerably cultivated for the seed. We have an oil mill at Salem, in an adjoining county, and a factory in progress for the manufacture of the lint. Hemp grows tolerably well, but is little cultivated.

FRUITS.

Penobscot County, Me.—Prospect of more than an average of pears and plums.

Middlesex County, Conn.—Apples and pears look more promising than for the past four years.

Ocean County, N. J.—Cranberries were injured in some bogs by the great heat of last June.

Randolph County, Ala.—The Scuppernong grape is growing finely. One gentleman has four acres planted.

Lincoln County, Miss.—Peaches a failure; about one-twelfth of a crop. Crop of plums fair.

Holmes County, Miss.—Fruit never better.

Wilkinson County, Miss.—Most peaches were destroyed by frost, but in places where they were not thus injured the crop is remarkably fine.

Ellis County, Texas.—Many varieties of the grape have rotted badly from wet weather; in some cases, one-half of the berries in the cluster.

Dallas County, Texas.—The peach crop is an entire failure, from late frosts in April.

Morgan County, W. Va.—The fruit crops are more promising than ever known before.

Russell County, Ky.—The apple crop the finest for ten years.

Callaway County, Ky.—Fruit crop not as good as at first supposed.

Mississippi County, Mo.—Fruit killed by late frosts.

Montgomery County, Ill.—There will be but a small crop of winter apples, and not more than one-third of a crop of early apples. Peach trees are well laden.

Hancock County, Ohio.—A fair amount of apple, peach, pear, and cherry bloom, but nearly all falling off.

Hardin County, Ohio.—If the apple trees continue to cast their fruit the crop will be a complete failure. Peaches are doing better.

Miami County, Ohio.—Grape crop superior to that of any former year.

Lake County, Ohio.—Prospect for peaches the best for many years.

Butler County, Ohio.—Peaches almost a failure. There is some complaint of "grape rot."

Douglas County, Nevada Ter.—Apples, pears, and plums were all killed by frost in May.

THE FRUIT, ETC., DAIRY IN EL DORADO COUNTY, CALIFORNIA.

El Dorado County, Cal.—Much attention is now given to the culture of the mulberry. The climate and soil seem to be well adapted to its growth. The dairy business is also fast increasing. Four thousand cows are this season employed in the business in this county. Our mountain valleys afford green grass during the summer months, while the river valleys are dry. It is certain, from fifteen years' experience, that the foot hills of the sierras afford a hardier and better quality of fruit than any other portion of the State. Two tons is an average crop of grapes to an acre. Five tons can be grown, with a little irrigation, of the superior quality of grapes.

CHEESE FACTORY IN OREGON.

Lane County, Oregon.—The first cheese factory in the county has just been started, and is making a good article. Our wool is mostly ordinary, and our breeds of hogs not sufficiently select. The immigration, now increasing, will, it is hoped, elevate the character of farm products.

MADISON COUNTY, ARKANSAS.

Madison County, Ark.—This section, I think, is the Switzerland of America. The climate is mild and genial; never very cold in winter, and the summers are made pleasant by ever-stirring breezes. During thirty-six years the thermometer has not indicated above 96° in the hottest weather, and rarely below zero in winter. The country is mountainous, and its general appearance is rough, interspersed with numerous fertile valleys, that yield from 40 to 80 bushels of corn per acre; wheat is the staple. Fruits of all kinds do well, and there has not been a total failure in the memory of the oldest inhabitant. This section will eventually be the fruit garden of the Southwest. The people are sadly behind the times in scientific farming, following the old-fashioned way, and using old-fashioned implements. I do not think there is a reaper or mower in the county, but farmers are beginning to awake to a sense of their duty. We need new seeds, new methods, more enterprise, and greater energy

EMIGRATION TO TEXAS.

Montgomery County, Texas.—Immigrants continue to pour into the State. Every paper published in Northern Texas speaks of its unusual continuance with expressions of regard. Heretofore immigration ended in the spring months early. The "tide" set into Texas very early last year, beginning in August. It is currently stated by letters and other sources of advice that an immense immigration to Texas will take place this winter. Among the present immigrants are a proportion from Tennessee, Kentucky, Illinois, Indiana, Wisconsin, &c. We hear, too, that the coming winter will bring us numbers of immigrants from the Eastern States, the public mind being better informed there now in regard to the reputed lawlessness prevailing. Farmers and other immigrants from the Eastern States will be duly welcomed in all parts of Texas within the frontier. We need the practical, adaptative, inventive genius of thousands of our northern brethren to help us develop and build up our State toward the wealth and prosperity its resources and capacities insure to us some day. None could give us better help than practical northern farmers and business men. I have wished so much that the "spirit would move" some of them to come and set up a cheese factory in an appropriate district of the State. Our condition is peaceable all over the State, except the immediate Indian frontier. Person and property are as safe everywhere as in other States, and opinions as fully enjoyed and expressed. The demoralization incident to the war is passing rapidly away. The most of the malefactors have been killed—many of them by each other—and their example and force diminished; those loosely inclined are restrained. I can safely say, from personal as well as other information derived from reliable sources, that the people of Texas, including the new-comers, are all cultivating the arts and desires of peace, and all that we now need are good laws, and good officers to carry them into effect. We are looking forward to the moral benefits to be derived from greater and more direct railroad connections east and west.

CHINESE LABORERS IN ARKANSAS.

Arkansas County, Ark.—This county has received a lot of Chinese from Hong Kong. The planters seem well pleased with them; they do their work well, and are careful and very cleanly in their personal attire. Should these prove a success, we will be able to get all the labor wanted, and can then work plantations for wages and be able to keep them in repair, which is impossible when working on shares. I do not think hands work as well this year as last, although nearly all planters assert that they do.

BIRDS AND THE COTTON WORM.

Montgomery County, Texas.—Our friend, the cotton worm, (in one sense friend, in "restraining excess of production,") has been seen webbing upon the cotton. It is not unusual for them to be seen at this season of the year; and if they were universally hunted and destroyed at their first appearance, we might very soon get them down, but that concert of purpose and of action cannot be had among cotton planters. Farmers will probably be among the last to obtain the benefits of combined purpose and action. The worms, coming early, sometimes eat the cotton leaves and disappear, and the cotton "comes out" again

and makes a fair crop, as it did last year with us; but they may continue, reproduce, and destroy the plant entirely. Something has been said in print about introducing the English sparrow to destroy the worm, but, so far as I know, no effort has been made to get them. The expense will probably prevent a decisive experiment of their utility. May I suggest that the Department supply to some careful farmers of Georgia and Alabama a few of these birds for experiment? The beneficial services of birds in destroying the cotton worms have been noticed in several instances. A farmer in Lavaca county planted a part of his cotton field in common millet, which ripened at the time the worms appeared in force and attracted the birds, who ate up the worms also, and preserved the cotton an acre deep where it and the millet joined. A like result was had in Grimes county, the adjoining cotton being kept clear of the worms by the birds. The plan most effective would be to plant millet in the cotton throughout the field. Other benefits would result from the sowing of the millet, it being the best forage known to us, and from leaving convenient passways over the field, in cotton gathering time, after the millet has been cut and saved. The local supply of birds would be wholly inadequate to the demand of half a dozen joining cotton farms. It has been suggested here, too, that to multiply birds (by protecting them) to an extent commensurate with the demand for cotton protection would render them too numerous and destructive. South Carolina and rice growing countries are troubled with rice birds very much some seasons, yet rice is abundantly produced, and there are ready means to be used when birds are in a great excess.

THE POTATO BUG.

Whiteside County, Ill.—The Colorado potato bugs have appeared in force.

Putnam County, Ill.—Potato bugs have made their appearance.

Boone County, Ill.—The bugs have attacked the potato vines. Acreage less than last year.

Madison County, Ind.—Potato bugs are very destructive.

Wells County, Ind.—The Colorado potato bug has made its appearance by millions.

Van Wert County, Ohio.—The potato bug has made its appearance in considerable numbers.

Mercer County, Ohio.—The potato bug is making sad havoc with the potato vines.

Jefferson County, Ind.—We have a new potato bug. I think it must be the "Colorado" bug. When full grown it is half an inch long and somewhat broad, striped, and multiplies freely. I have succeeded best in disposing of them by shaking them off into a pan and destroying them. I tried lime on the potato vines with some success.

Monroe County, Mich.—Two kinds of potato bugs, called here the Colorado and the California, are making considerable ravages upon the crop. The Colorado bug is of a reddish color, resembling, at a little distance, a lady bug, but is without wings, and sluggish in habits. The California is a large, striped bug, nearly an inch long, with wings. They are very active, and great eaters. The former are the most numerous.

Green Lake, Wis.—I have been using the following remedy for the potato bug, which has become a serious nuisance and destroys the crop when *it* is not destroyed. One part of Paris green and forty parts of flour mixed and sprinked on the vines when the dew is on, or the vines

are wet. It does the work effectually. Of course the remedy must be repeated as occasion requires.

THE HEEL FLY.

Burleson County, Texas.—Some time since I received a letter from you, requesting a specimen of the heel fly, so troublesome to Texas cattle, and what I know of its habits. The request came too late for me to furnish the specimen this year, as they disappear early in April. I will comply next spring. The fly is similar in appearance to what is known as the nit fly, so troublesome to horses in the fall. It is somewhat larger, however, and of a lighter color, and makes scarcely a perceptible buzz when flying. It attaches itself to the flank, leg, or belly of cattle when depositing its eggs, fifteen or twenty of which are firmly attached to a hair in a straight line. During their season, it is almost impossible to plow with oxen during the middle of the day.

Out cattle, on being attacked, raise their tails perpendicularly and run to a thicket, water-hole, or canebrake, where they remain nearly the whole day. When so tormented, cattle will often bound off bluffs or run into bog-holes and swamps. As the cattle are never fed, and always poor in the spring, these pests cause an annual loss of many hundreds every year in this county.

I know nothing of the larvæ state or transformations of this fly, nor are any remedies used that I know of. It is found from the Brazos to the Rio Grande. I have never heard of its being in any other State. It first appears with the rising grass, in February or March, and disappears in April.

HOG CHOLERA.

Boyle County, Ky.—Hog cholera is becoming quite prevalent. All remedies fail. Several farmers have lost their entire stock. I have lost 50 per cent.; of those attacked only three recovered. No known cause for the disease. Generally farmers lose about one-third of their stock. The disease having expended its virulence runs out in the pigs.

JERSEY STOCK IN IOWA.

Clinton County, Iowa.—I have been introducing the Jersey stock into this place. Bought a bull and two heifer calves three years since. The heifers came in last April and May at two years old; they were as large as the common stock here. Kept them the same as my other stock, and find them hardy and more easily kept than the common stock. In less than ten months they have made 400 pounds of butter, that brought me $125; sold one of the calves at nine months old for $100, and have another that I can sell for $120, (both of the calves were bulls—heifers would be worth more;) took $100 in premiums at the county fair, one of which took the first premium as the best dairy cow on exhibition. One of them made nine pounds and thirteen ounces of butter, and the other eight pounds and fourteen ounces in one week in June; fed entirely on grass. One of them had a second calf just eleven months after the birth of the first.

DISEASE AMONG CATTLE.

Owsley County, Ky.—Several head of cattle died in the month of May of what is called dry murrain. The best farmers think these cattle

died from eating white-oak leaves before the fuzz comes off, which dries cattle up and they die very soon afterwards. They quit eating.

DOGS VERSUS SHEEP.

Campbell County, Tenn.—I have recently purchased some land in Eastern Tennessee, with the intention of going largely into sheep, breeding, if the prospects should prove encouraging. But I am afraid there will be a great drawback to an enterprise of this kind from the want of some legislation with reference to dogs. I hope it may be possible to call attention to this want, by submitting to members of Congress some account of the great depredations committed by these animals, thus inducing some national or State legislation for the relief of sheep-breeders.

BRITISH IMPORTATIONS OF 1870.

WHEAT.

The importations of wheat and flour into Great Britain, for five months of the present year, are larger than the receipts of five months of last year. The increase amounts to 1,447,108 hundred-weight of wheat, and 432,087 barrels of flour, equivalent to nearly five millions of bushels of wheat. The amount supplied by the United States was 5,264,745 hundred-weight of wheat, and 920,934 barrels of flour, together equivalent to 14,432,194 bushels of wheat, against 7,387,717 bushels for the like period of last year, an increase of 7,044,477 bushels. This increase is more than two millions greater than the total increase from all countries, showing a falling off elsewhere to that extent. The official figures are given in detail as follows:

Where from.	Quantities imported.	
	1869.	1870.
WHEAT.		
	Cwt.	*Cwt.*
Russia	3,015,148	4,269,872
Denmark	160,318	197,101
Prussia	1,734,041	984,241
Schleswig-Holstein and Lauenburg	24,909	6,011
Mecklenburg	276,860	304,634
Hanse Towns	293,881	137,312
France	117,726	15,987
Illyria, Croatia, and Dalmatia	390,170	42,327
Turkey and Wallachia and Moldavia	604,822	181,162
Egypt	329,343	95,550
United States	3,131,597	5,264,745
Chili	165,074	73,584
British North America	43,061	194,070
Other countries	164,767	132,229
Total	10,451,717	11,898,825
WHEAT-MEAL AND FLOUR.		
Hanse Towns	243,822	378,733
France	649,692	500,072
United States	308,414	920,934
British North America	18,423	24,556
Other countries	437,662	265,805
Total	1,658,013	2,090,100

COTTON.

The importations into Great Britain for five months ending May 31, 1870, are 4,999,414 hundred-weight, of which the United States furnished 3,340,952 hundred-weight. For a similar period of 1869 they were 3,990,762 hundred-weight, of which 2,210,011 hundred-weight were from this country. The total increase is 1,008,652 hundred-weight; the increase from this country 1,130,941 hundred-weight. This makes a decrease from other countries of 122,289 hundred-weight.

ENGLISH CROPS.

The following, relative to the crops of England, is an extract from a letter dated June 20, written by Geo. J. Abbott, esq., United States consul at Sheffield, England:

A severe drought has prevailed throughout England, and more especially in the northern counties, for three months past. This drought has also extended to France, as you will see by the printed slips annexed to this letter.

The hay crop will be a very small one in this part of England. They are already commencing mowing, but the crop is light and hay has already advanced, and is advancing, in price. The cattle have been turned out in many grass fields before mowing, the pastures no longer affording them food.

The wheat crop, I think, has also been much injured by the drought, and wheat has advanced in price.

The probability is that there will be a great demand both for wheat and hay from the United States. Two years ago, in 1868, when a severe drought parched the fields and injured the hay crop, there was commencing a large importation of hay from the United States, but when the newspapers reported that the foot and mouth disease* had broken out among the cattle from Texas an order in council was issued, imposing so many restrictions upon the importation of hay that it broke up the trade.

I suggested to Mr. Johnson, who then represented the United States in London, to represent to Lord Stanley, who was then at the head of the Foreign Office, that the hay which was at that time coming to England from the United States was imported almost entirely from the New England States and New York, and that the cattle affected with the disease, which was alleged to be prevailing, were more than a thousand miles away from the hay fields of those States, and that not one of them had ever set foot within them, so that there was no danger whatever of the introduction of the disease into Great Britain through the hay which was then imported. The order in council was subsequently modified, but not until considerable time had elapsed.

BONE FERTILIZERS.

The Department, having been applied to of late by many of its correspondents to issue some general instructions by which farmers might manufacture their own manures, has prepared the following, accompanied by such remarks as would make the manipulation intelligible.

Bones are almost completely insoluble in water—practically so. When very finely divided, as in fine bone dust, a small amount is dissolved by the water of the soil containing carbonic acid, but the quantity is small, and the time taken to do it is great. For the useful effects of bones, therefore, the farmer must dissolve them, and sulphuric acid is alone the most powerful and economical means for that end. It depends on the different form of bone which the farmer operates on as to how much acid will be required. The sulphuric acid used should be of considerable strength, and the farmer should ask for it of the specific gravity of 1.70 or marking 140° Twaddell. When the acid reaches the bones, the mass effervesces, boils up, and becomes warm, the sulphuric acid taking away

* Texas cattle disease is meant.—[Ed. Rep.]

two-thirds of the lime of the bone from the phosphoric acid, which remains united with the other third, forming a superphosphate, biphosphate or mono-calcic phosphate, which substance is perfectly soluble in water, and is called soluble phosphate. The sulphuric acid uniting with the lime forms a sulphate of lime, (gypsum, or plaster.) So that in every heap in which a superphosphate has been made there is always an amount of sulphate of lime (plaster) formed, and the plaster forms the greater portion of the whole mass.

The bones which are used for making superphosphates by manufacturers, or which may be had by farmers, are found in the following conditions: 1. Bone dust or ground bone. 2. Boiled or steamed bones. 3. Bone ash of sugar refineries.

1. *Bone dust.*—Before the bones are crushed they are now generally boiled for the sake of the fat, which is sold to the soap boiler. It is of no value as a manurial agent, but is rather deleterious, coating the bone and protecting it from the action of the acid, and it would be advisable for the farmer when possible to boil the bones.

2. *Boiled or steamed bones.*—Bones are steamed for the purpose of removing gelatine or animal matter of the bone for the purpose of converting it into glue. The effect of steaming on bone is therefore to deprive it of some of its organic matter, but it must not be supposed that the whole of the organic matter is removed; a considerable quantity remains, and some ammonia can always be found in such bones when decomposing. A reference to the analysis shows that not more than five or six per cent. of organic matter has been extracted from the bone.

3. *Bone ash.*—If bones are burned in contact with the air, the greater part of the carbon is driven off with the other combustible parts of the bone. To avoid this result, which would render the ash worthless for the use of the sugar refiner, the bones are charred in heated iron cylinders, out of contact with the air, by which only a portion of the animal matter is burned off. A large amount of finely-divided charcoal remains, mixed with the bone earth, giving the valuable properties to the bone ash. It has become a great deodorizer and antiseptic, and capable of condensing gases within its pores, by which means it retains both the ammonia and nitrogen of the soil and the manure. The black color of the bone ash is due to this charcoal.

	(Voelcker.)		(Anderson.)
	Bone dust.	Steamed bone.	Bone ash.
Moisture	12.06	8.06	6.10
Organic matter*	31.12	25.45	5.05
Phosphates of lime and magnesia, (bone earth)	49.54	60.48	79.20
Carbonate of lime	4.99	3.25	4.05
Magnesia and alkaline salts, (chiefly common salt)	1.91	.43	.15
Sand	.38	2.33	5.45
Total	100.00	100.00	100.00
* Containing nitrogen	3.69	1.84	.....
Equal to ammonia	4.49	2.24	.....

One hundred pounds of bones, ground, crushed, or dust, (not burned,) require forty pounds of sulphuric acid, (vitriol.) This quantity, if acting solely on the bone phosphate, would remove two-thirds of its lime; but, as there is always some carbonate of lime present, this is first acted on

by the acid, and thus some of the phosphate escapes decomposition, and remains in the mass as insoluble phosphate; hence in the mass there are always three constituents, the amount of which it is desirable the farmer should know, viz: the soluble phosphate, (mono-calcic phosphate,) the insoluble phosphate of lime, (undissolved bone earth,) and the sulphate of lime. These are the three important substances in a superphosphate, for although ammonia may be potentially present if raw bones have been used, yet a superphosphate is not made or used for the sake of the ammonia; and when bone ash or burnt bone is used no ammonia is required.

If calcined bones, or the bone ash of the sugar-house, be the material used, every 100 pounds will require 87½ pounds of vitriol; when these have fully acted on each other the mass would give: superphosphate of ime, 26 pounds; gypsum, 66 pounds; sulphate of magnesia, 1½ pounds; soda, 2¾ pounds, and the balance of the 187½ pounds would be water and undissolved bone earth. If the farmer uses steamed bones, a quantity of vitriol intermediate between the two proportions named will be needed, say 66 pounds.

The usual mode of making the fertilizer is to select a good wooden floor of a barn, well covered overhead, or to make a box floor of thick plank, laid tight. On this first throw the bones. If not in dust, it would be well to sift the bones, and place the coarser part on this floor, putting the finer portion aside for mixing in afterwards. By this means the rough bone will come in contact with the strong acid first and be more effectually divided, while the finer parts can then be added to dry up.

No metal (except lead) should be used on the floor, or where the acid can reach. Water equal to one-fourth or one-sixth the weight of bone is then to be poured on the bone, well stirred in with a spade, and left for two or three days to heat and ferment; it would be well to use the water boiling. Then add the sulphuric acid, mixing well with a wooden spade or board; the mass effervesces, or boils; stir twice a day well for two days, so as to turn the whole mass over; let it stand for two or three days to dry; add the fine bone and mix well. If not dry, use some absorbing substance, as sawdust, dry peat, or dry earth, in small quantities, and mix well. *Do not use for this purpose lime, ashes, or marl,* as they would destroy the superphosphate and spoil the whole work. Made in this way from bone ash, this fertilizer will yield 30 per cent. of soluble salts, of which 26 per cent. is superphosphate of lime. The manufacturer will say that there is 35 to 37 per cent. of superphosphate present, but he always over-estimates; indeed, 26 per cent. of soluble superphosphates is *more* than any farmer wants; it is too soluble, and will pass out of his ground too soon, especially in wet weather; 12 to 15 per cent. is a better proportion for the farmer, for then he has a proportionally larger amount of insoluble bone phosphate in store for future use in the soil. On this account it is better for the farmer to use raw or steamed bones than bone ash; he has a sufficient, though a smaller, quantity of superphosphate present.

This fertilizer will not suffer from exposure to air, but it must be protected from rain or wet; it ought to be barreled up when not used immediately. This fertilizer, made as directed, will be of a whitish color if made from raw or steamed bone, and gray black if made from bone-black of the refinery; but the color of a superphosphate is of no consequence, and no test of its quality; neither is its smell; it ought to have no smell, or a faint acid odor, if any. One ton of a manure made by the farmer as directed is worth two purchased in the market.

A good manure may be made from bones without forming a superphosphate, by dissolving the animal matter of the bone by means of alkaline leys, and thus freeing the bone earth, which is then in excessively fine particles fit to be dissolved in the waters in the soil. Many recipes have been given for this. Dr. Nichols, in his Boston Journal of Chemistry, (February, 1869,) gives the following, which he recommends: Take a barrel of fine-ground bone and a barrel of good wood ashes; mix well together and add three pailfuls of water; mix the whole intimately, stirring daily; the mass will be fit for use in a week. This is a good manure for corn, a gill being used to the hill. In this fertilizer there is, as stated, no superphosphate found; the bone earth is merely separated from the hard gelatine or animal matter, which is dissolved by the potash of the wood ashes; this organic matter is in a soluble state, the bone earth is finely divided, and there are present the potash and other mineral salts of the wood ash, all of which make a most valuable fertilizer.

The South Carolina phosphates may be treated in a manner similar to bone ash of the refinery, with vitriol, but will not make so valuable a manure, because the amount of phosphate of lime present is not nearly so great as in bone ash; it rarely exceeds the quantity in bone dust, and has 10 to 20 per cent. useless matter present. Carolina phosphates at $30 a ton will not make a richer fertilizer than raw bone at $45 a ton.

T. A.

THE ALVARADO BEET SUGAR FACTORY.

A company was organized some time ago in California for the purpose of manufacturing sugar from beets, it having been demonstrated that the climate of the State is well adapted to the development of saccharine matter in the beet. With a capital of $250,000 the company began its operations at Alvarado, a town about twenty miles south of San Francisco. The factory is already in a forward state of construction, and the requisite machinery, of elaborate and finished character, is being made in San Francisco. The building is large and commodious, requiring for its construction 78,000 feet of lumber. The following machinery and apparatus will be used in the factory: Four tubular boilers, each 54 inches in diameter and 16 feet long, with steam and mud drums, all complete, and embracing everything in the way of the latest improvements; two engines, 14 by 30, of first-class finish; one small engine, 16 by 12; one vacuum pan and two air pumps, four saturation pans, five filters, two filter pumps, one beet grater, one beet breaking machine, one beet washing machine, three mortejus, (tanks in which sugar and sirup are elevated from one floor to another,) also, a number of large sheet-iron tanks for various purposes about the works. In addition to these is a multitude of shafting, pulleys, pipes, pumps, and various fittings incidental to a complete sugar manufacturing and refining establishment, capable of working up fifty tons of beets per day.

The factory will be ready to go into operation about the first of September next, or as soon as the beet crop comes in. It is the intention of the company to depend chiefly for their stock of beets upon the neighboring farmers, who will receive a fair price per ton for them, delivered at the factory.

The operations of the work will be under the immediate supervision of gentlemen of experience, who were, indeed, for a long time engaged in

some of the most extensive beet sugar factories of Germany. The factory will give employment to from 100 to 150 men.

The Scientific Press, (San Francisco,) of June 18, says:

The manufacture of sugar from beets ought to form one of our most available and profitable branches of industry. The waste products or pulp, after the saccharine matter has been extracted, afford excellent food for cattle and hogs, and will be found especially serviceable for use by the dairy establishments from which this city is supplied with milk.

PRIZES FOR ESSAYS ON AGRICULTURE.

The State Agricultural Society of Georgia, in the list of premiums for the State Fair of 1870, offers the following prizes for essays, competition to be open to all:

1. For the best essay on the culture of cotton, $100.
2. For the best essay on the culture of corn, $100.
3. For the best essay on the culture of wheat, $100.
4. For the best essay on the culture of grasses and forage plants, $100.
5. For the best essay on the value of cotton seed as plant and animal food, with description and estimate of machinery necessary for its preparation, $100.
6. For the best essay on the improvement of land by the turning in of green crops, in comparison with other modes of improvement, $100.
7. The best essay on the practicability and profitableness of manufacturing the cotton crop of the South within our own limits, $100.
8. For the best essay on wool growing at the South, $50.
9. For the best essay on the profitableness of raising thorough-bred stock, $50.
10. For the best essay on draining, $100.
11. For the best essay on irrigation, $100.
12. For the report of the most valuable farm, $100. (This report must give full statement of its management; the value of the land per acre; the number of acres in cultivation; the value of every animal used in cultivation; the whole expenditure of money for the year; quantity of each farm product raised; amount of money received; full details in every respect; whole net profits. In determining the question of the most profitable farm, the costs of improvements in buildings and the value of woodlands are not to be considered as part of the investment in the farming operation, but only the value of the cultivated land.)
13. For the best essay setting forth the best commercial fertilizer, the facts and reasoning to be sustained by an experiment made by the writer, which experiment shall show the amount of fertilizer used, the ingredients of the fertilizer, and what proportions, combined with cost and product, and show what fertilizer, with its combinations, is best adapted to corn, what to cotton, to wheat, or to other crops, $25.

SALES OF KENTUCKY STOCK.

The following sales of stock were made by Kentucky breeders at their annual public sales during the last week in June:

At Mr. Alexander's sale, 6 thorough-bred mares brought an aggregate of $1,365, or an average for each animal of $227 50; 18 thorough-bred

colts, foaled 1869, $8,485, average, $471 38; 24 thorough-bred fillies, foaled 1869, $9,500, average, $391; 13 head of trotting stock, $4,145, average, $317 31; 27 Alderney cattle, $4,125, average, $152 77; total proceeds of sale of 88 animals, $27,620, an average of $313 86.

At F. P. Kinkead's sale, 14 horses brought $2,120, at an average of $151 42; 5 bulls, $918, average, $183 60; 12 cows, $4,360, average, $363 33; 3 Alderneys, $655, average, $218 33; 31 head of sheep, &c., $532, average, $17 16; 7 hogs, $311, average, $44 28; for the lot, 72 head, $8,895, an average of $123 54.

At the sale of Jesse H. Talbutt, 28 cows brought $6,215, an average of $221 96 each; 8 bulls, $1,955, average, $244 37; for the 36 animals, $8,170, an average of $227 50.

At B. B. Groom's sale, 73 cows aggregated $18,230, an average of $249 73; 18 bulls, $3,335, average, $185 28; 10 head mixed, $830, average, $83; total for 101 head, $22,395, average, $221 73.

At Lewis Hampton's sale, 34 cows and calves brought $11,010, an average of $323 82; 9 bulls, $2,295, average, $255; 3 cows, miscellaneous, $675, average, $225; total for 46 animals, $13,980, an average of $303 91.

At Mr. Kinkead's sale, the highest figures for single animals was as follows: Sorrel gelding, $280; a bull, $365; a cow, $1,000; Essex hog, $75. At Mr. Talbutt's sale, a roan bull, calved in 1867, sold for $620, and a roan cow, calved in 1862, $580. At Mr. Groom's sale, a cow calved in 1866 was sold for $1,120, and a bull calved in May, 1864, $1,015. At Mr. Hampton's sale, the highest priced cow was $505; highest priced bull, calved in 1869, $500.

UNION STOCK YARDS, CHICAGO, ILLINOIS.

The following exhibit of receipts and shipments of live stock at the Union Stock Yards, Chicago, Illinois, for the six months ended June 30, 1870, is furnished by George T. Williams, assistant secretary:

	Cattle.	Hogs.	Sheep.	Horses.
RECEIPTS.				
Chicago, Rock Island and Pacific railroad	37,839	118,766	12,484	33
Illinois Central railroad	42,305	158,538	46,600	153
Chicago, Burlington and Quincy railroad	60,321	212,351	31,396	548
Chicago and Northwestern railway	48,961	129,421	30,762	358
Chicago and Alton railroad	36,931	76,101	20,704	208
Pittsburg, Fort Wayne and Chicago railroad	112	494	100	8
Michigan Central railroad	338	1,844	510	56
Michigan Southern railroad	458	2,247	4,646	84
Pittsburg, Cincinnati and St. Louis railroad	534	2,424	1,232	.....
Driven into yards	1,089	456	.....	.....
Total	228,888	702,642	148,434	1,956
SHIPMENTS.				
Pittsburg, Fort Wayne and Chicago railroad	60,279	144,437	1,879	294
Michigan Central railroad	51,501	68,795	43,833	244
Michigan Southern railroad	60,984	203,069	2,329	539
Pittsburg, Cincinnati and St. Louis railroad	2,588	1,107	.....	73
Chicago, Rock Island and Pacific railroad	1,014	154	225	390
Illinois Central railroad	3,895	123	.....	15
Chicago, Burlington and Quincy railroad	691	.....	196	23
Chicago and Northwestern railway	643	1,077	350	432
Chicago and Alton railroad	4,729	.....	75	95
Total	186,324	418,762	48,847	2,105

THE CROPS IN GERMANY.

W. Prentiss Webster, United States consul general at Frankfort, writes to the Department under date of June 20, as follows, in reference to the crops in Germany:

The season has now far enough advanced not only to indicate, but to sadly demonstrate, that the grain crop will not probably exceed one-third, and cannot equal one-half of its average amount. There has been no rain in any of the German States for the last four or five months. The lands are dry and parched. The crops are hardening, and will scarcely mature at all. The hay crop will be useless, and not worth cutting. The prices of all kinds of breadstuffs are daily and almost hourly rising.

At Mentz, the principal grain market of western and southern Germany, the dealers hardly know at what price to sell. They describe the prospect as discouraging in the extreme, and expect a great rise in prices. Every day adds to the gloom and despondency of this community, who begin to believe that great suffering awaits the poor and laboring classes. In some parts of Prussia, farmers are beginning to sell their cattle on account of the already-pressing costs and prices of keeping, so that poo beef is very cheap at the present time, and good fat beef is not to be found. I believe that the prospects are worse for Germany than for France or England.

In Hungary and Bohemia, and other parts of Austria, and perhaps all eastern Europe, they had much rain early in the season, and the crops there are said to be looking well, and to promise about an average yield. These countries, however, can do but little toward supplying others. There are but few railroads, and the transportation from remote parts of the country must be too difficult and expensive.

At the Bourse the prices of all Austrian railroads have advanced greatly on account of the prospective receipts from the transportation of grain during the coming season.

Of course there must be great exportations from America, and much larger than at any previous period. Indeed, the question will not be how much can be sold in Europe, but how much can the United States supply.

I think that it is generally believed that no change of weather or any possible contingency of events can materially alter the prospects of European harvests. The stock on hand of breadstuffs is not large, and we must soon look abroad for supplies.

ST. DOMINGO.

Mr. F. Schumacker, in transmitting a package of textile and other plants of St. Domingo to this Department, writes as follows:

I had the pleasure, by the mail a month since, of advising you of my intention to forward by this steamer the lace bark tree. It is at Neyba, west coast of the Bay of Ocoa. President Baez sent for it, but it is so little known no one could be found to select it. The President's brother, the governor of Azua, is now here, but will return in a few days, and will obtain a specimen; also, the "Palo del Cruz." Mr. Baez himself knows the lace bark well, and has frequently seen it at Neyba. I hope to furnish it by the steamship Tybee, of July. Mr. Baez has kindly furnished me, for your Department, the "guarantey," a textile, in which I feel a great interest. You have some of these plants in the package; also, specimens of the *bark*, to which I call your special attention. The plant is abundant, (propagated by layers or cuttings,) of great strength, and, I imagine, is well adapted to linen fabrics. The leaf is so tenacious it can scarcely be ruptured, and would pulp admirably for paper stock. The plants I send have been out of the ground now two weeks, and have lost the leaves, which I regret. They were sent to the President from the Bay of Ocoa. This island could furnish the world with textiles.

I have sent an agent to the States to get a machine to strip the cabaya and prepare it for market, if such can be found. The maji and other plants also furnish textile material, but the cabaya and the guarantey are at the head of the list. In dye and cabinet woods no country is richer.

You have no conception of the resources of this favored land. Under Spanish rule it has exported one hundred millions annually. Under American enterprise this might be increased ten-fold. Coffee, cocoa, tobacco, cotton, sugar, fruit, dye and cabinet woods, annatto, tumeric, and indigo, (of which it supplied Europe at one period with more than half its consumption,) are here in the greatest abundance, and without season. Four crops of corn are produced annually. Almost every vegetable has a marketable value as a medicinal plant, or otherwise. Nearly every stream flows over sands of gold, and every hillock contains metallic wealth and magnetic irons. Cinnabar, cop-

per, gold, silver, and nickel abound. Salt exists in mountains, in semi-transparent crystals.

We have not a plow, steam-engine, or wagon-road on the island, or a saw-mill, and yet, such is the natural resources, over $800,000 was paid last year for transportation alone, from Santiago to Puerto Plata, about fifty miles.

The following is a list of the plants received:

Aguacata, 3.—Vegetable fruit; a delicate salad vegetable; called here avocata, or alligator pear.

Mamey, 1.—Fruit.

Maji, 7.—The indispensable hedge-plant of the island; very large and impenetrable; a textile.

Indigo, 7.—Common in all open lands.

Arneira, 1.—Flower; bright pink, in large clusters.

Guarantey.—Textile.

Mariposa.—Parasite on the sour orange, or lime.

Franbottan, 6.—A gorgeous scarlet flower tree.

CULTURE OF MADDER IN SMYRNA.

E. J. Smith, United States consul at Smyrna, gives the following account of the culture of the madder root (*Rubia tinctoria*) in that region:

The ground usually selected is a flat or level plain, composed of a red and damp soil, but well drained. The color of the soil is said to affect the color of the root, giving it a deeper red tinge, which is the quality most highly prized. When grown on hill-sides or on high hard ground it is of a lighter color, and is less esteemed than the former. As a rule a dark soil is always chosen when it can be procured.

Plowing begins in May, and is repeated at intervals of a fortnight till October, to render the earth as friable as possible. As the rains generally set in about this time, the ground is allowed to rest until it is plowed previous to sowing, which takes place in February and March. Between October and February, however, the ground may be replowed whenever it is practicable. The seed is sown broadcast, and the ground manured and left undisturbed. About 300 pounds of seed are sown on an acre. As soon as the plant has grown some inches the ground is hoed and weeded. This operation is repeated as often as possible. Six months after sowing, drills are made of the width of about one foot, at intervals of three feet, the earth from these drills being thrown over the plants so as to completely bury them. This is repeated every year, or as often as is thought requisite, in order to force the strength of the plant downward and produce roots instead of stems and leaves. Some of the roots thus treated attain the depth of six feet. This process is performed only on the plains; on hill-sides it would be useless, as the rains would wash away the earth too frequently. The plant is allowed to remain in the earth from three to seven years; but the usual time is five or six. As a general rule the longer it remains in the soil, up to the seventh year, the thicker and better the roots will become. In certain locations, however, where great dampness prevails, it cannot be allowed to continue more than three years, as a certain grass springs up which completely chokes it, causing destruction of the crop.

When the roots are to be taken up, the stems are cut down and the seed collected. Drills are then dug to the required depth, and the roots on either side laid bare, which renders the extraction of the whole easy and complete. The roots are laid in bundles, and then carried to a reserved piece of ground well beaten and perfectly dry, having been previously prepared for their reception. On this the madder is spread out to dry through the powerful action of the sun's rays. Although an easy process, this is a most important one, and should be performed thoroughly; as, if the madder is packed damp, mould will ensue and deteriorate the quality. For this reason principally the summer season is always selected for this purpose. In winter it has to be dried in ovens, but the quality becomes inferior, and it seldom dries well. The roots are packed as closely as possible in hair bales containing 420 pounds, and then sent to town. Here the bales are opened and the roots subjected to steam pressure, which reduces their bulk one-half. They are then enveloped in canvas, and bound with iron hoops ready for shipment.

The average cost to the agriculturist of a quintal of madder of one hundred and twenty-five pounds, including all expenses till the time of packing in the interior, as also the tenth paid as a tithe to the government, is 140 piasters or $5 25, not including

ground rent. The charge for bringing to town by camels and by rail combined, or by camels alone, is from 15 to 25 piasters, or nearly 60 cents to one dollar, and depends mostly on the season and the condition of the camels. Two years ago charges were more than doubled, owing to a fearful epidemic which raged among these animals, and destroyed great numbers. Day laborers, for hoeing, weeding, and carrying, receive 15 to 20 cents per day. Last year as high as 40 cents were paid, but this was an exceptional case and due to fever, which disabled many of the workmen. The work of collecting or extracting the roots is paid for on a different principle, the most skillful workmen receiving the highest remuneration. The pay is 20 cents every one thousand drams, or seven pounds. Madder seed now costs in the interior 20 to 24 cents per oke of three pounds, but some time ago it could be obtained for eight, or even four cents per oke.

The best quality is called Bakir, from a village of Kirkayatch, where it is produced. That grown in the districts of Magnesia, Axar, Kelembo, Yayakioi, Sulumauli, and Balukessar, goes by the same name, Bakir. About forty thousand bales of this quality are produced in a good season. This year they will produce but half this quantity. The second quality may amount to thirty thousand bales in the best season, and comes from Demirzi, Hayagick, Yiardes, and Caramania. Only ten thousand bales are expected this year from these districts.

CINCHONA CULTIVATION IN INDIA.

C. B. Clarke, esq., officiating superintendent of the botanic gardens, and in charge of cinchona cultivation in Bengal, in his annual report to the secretary of the government of Bengal, makes some interesting statements relative to cinchona cultivation in India. Mr. Clarke thinks that cinchonas thrive best at about two thousand feet above the ocean, and grow very well down to the rivers at eight hundred feet elevation. *Cinchona calisaya* grows best at similar elevations, but will not grow so high as *C. succirubra*. The only plants in the Rungbee plantations which are *above* four thousand feet elevation are some *C. officinalis*, which are being tried at this higher level as a last experiment as to whether the species can be cultivated at all at Rungbee.

The manufacture of the crystallized sulphate of quinine now in general use, consists of two stages. The bark is treated with dilute acid, which takes up the alkaloids contained in it, and also a certain quantity of coloring matter, resin, and other rubbish, which quantity is considerable in *C. succirubra* bark, the only bark which for some years will be produced in quantity at Rungbee. The acid infusion is neutralized by an alkali, when the quinine alkaloids are precipitated, accompanied with more or less of the rubbish. These precipitated alkaloids (more or less impure) are known as the first stage of the manufacture. The second stage is, in actual manufacture, generally performed by washing out of these precipitated alkaloids (by strong alcohol) the quinine, and evaporating the alcohol.

According to Dr. Broughton's cinchona report of August, 1868, the quinine alkaloids are valuable febrifuges, and operate pretty much as quinine, but are less powerful. Roughly, it may be said that two grains of cinchonidine are equal in all respects to one grain of quinine. The action of cinchonine and the other minor quinine alkaloids is less satisfactorily made out, but in the *C. succirubra* bark usually 75 per cent. of the alkaloids present are either quinine or cinchonidine. If the precipitated alkaloids are dissolved in dilute sulphuric acid, the dose is equivalent to that of the crystallized sulphate diluted in acid. Several doctors of experience in the medical department of the government object that the crystallized sulphate is pure, and that they can be sure of the dose they give to a grain; whereas in the precipitated alka-

loids the proportions of cinchonidine, and even more inert alkaloids, will be variable and doubtful.

Cinchonidine is about one-third the value of quinine, and its crystals are exceedingly like those of quinine. There is very little quinine in general use at present that is not deeply adulterated with cinchonidine. Should the production of precipitated alkaloids be carried on upon a large scale, it would be possible to thoroughly mix a large quantity, analyze a sample, and then issue it with the percentage of quinine and cinchonidine certified on the labels of the bottles.

After protracted experiments, Mr. Clarke states it as his opinion that the successful manufacture of quinine is not a particular secret, or the adoption of any particular routine, but is the result of the application of skillful manipulation and minute experience at each step and turn of the work.

The prunings and thinnings of this season are estimated to produce about 1,500 pounds of bark, of which nearly 1,000 pounds will be bark from wood three or four years old, the remainder from second year bark.

In the bark, from very young shoots, the quantity of resin present is large, and it must be dealt with by boiling in alkaloid water, notwithstanding the sacrifice of a percentage of the small quantity of quinine present, consequent upon the operation.

In regard to working fresh bark Mr. Clarke says:

> It has been stated that bark gives up its quinine more readily in a fresh state. I have tried the fresh bark and have not obtained a good result. I have little doubt that this failure was because my bark was not cut fine enough. Indeed, I could see that the dilute acid discolors the bark hardly one-fortieth of an inch deep. There will always be a great practical difficulty in working the fresh bark on a large scale. The fresh bark cannot safely be stored, as it soon ferments. Now the bark only "rises;" that is, is fit for stripping at certain times; so that in the factory, if we worked fresh, we should be compelled to provide a very large quantity of machinery indeed, so as to be able to take in hand, at once, the bark that would come in upon us irregularly in masses. By working it dry we can work it regularly at our leisure.

The number and distribution of cinchona plants in the government plantations at Darjeeling on the 1st of April, 1870, are stated as follows: Of all species, number in permanent plantations, 1,500,658; number of stock plants for propagation, 40,000; number of seedlings or rooted cuttings, in nursery beds for permanent plantations, 379,325; number of rooted plants in cutting beds, 340,127; number of cuttings made during the month, 2,000; total number of plants, cuttings, and seedlings, 2,262,110.

WHEAT CULTURE IN ENGLAND.

At a late meeting of the Kingscote Association, England, Mr. Burnett stated that a much larger quantity of wheat and barley per acre is now produced on the Cotswold hills than was grown thirty years ago. This, he said, does not result from the adoption of any new system of cultivation, but from improvement of the old—in the time of planting, the use of drills instead of broadcast sowing, in the use of improved implements for preparing the soil, and in the application of richer manure. Whether the present system of wheat cultivation can be so improved as to yield a greater remuneration without injury to the crops that follow is an important question. Steam cultivation is one of the great improvements of the day on heavy lands, but where we can plow an acre a day with a pair of horses the steam culture will not pay. In this neighborhood deep cultivation has been tried and has failed.

Top-dressing in the spring with artificial manures has been advocated by many. In 1862 he tried this system, and his experiments show the following results:

TOP-DRESSING WHEAT.

Manure applied.	Produce of one year.	Wheat.	Value at 6s. per bushel.	Loss of manure.	Balance.
	Bushels.	*Lbs.*	£ s. d.	£ s. d.	£ s. d.
Procter's wheat manure *	38½	60	11 11 1	2 0 0	9 11 0
Guano †	36½	60	10 19 0	2 0 0	8 19 0
Nitrate of soda ‡	37½	59½	11 5 0	2 0 0	9 16 0
Soot	38	60	11 8 0	1 12 0	9 16 0
No manure §	32	60¾	9 12 0	.....	9 12 0

* Produced a larger quantity of straw, but inferior sample.
† Similar quantity of straw and sample.
‡ Largest quantity of straw and poorest sample.
§ Smallest quantity, but much the best sample.

Some are of the opinion that top-dressing is advisable where there is a thin, weak plant. Mr. Burnett said that many proofs might be brought in support of this opinion, but he would only mention one, supplied by the late E. Drew; an application of four hundred-weight of Messrs. Procter's wheat manure per acre, at a cost of 32*s*. Calculating the wheat at 6*s*. per bushel, and the straw at 20*s*. per ton, left a loss of 4*s*. 8*d*. Guano, under precisely similar circumstances, gave a profit of £1 4*s*. 9*d*. Nitrate of soda gave a profit of £3 4*s*. 5*d*. The straw and grain from the wheat manure were of better quality than from either of the others.

POTASH AS A MANURE.

The large proportion of potash in the ash of plants suggests the probability of its value as a fertilizer. The following table gives, from the analysis of Professor Way, 1st, the ash per cent. in the dried plant; 2d, the potash; 3d, the chloride of potassium in the ash of various grasses:

NATURAL GRASSES.

	1.	2.	3.
Meadow fox-tail grass	1.55	37.03	9.50
Sweet scented vernal grass	1.24	32.03	7.03
Downy oat grass	2.01	31.21	4.05
Soft brome	1.36	30.09	.....
Crested dog's tail	2.38	24.99	11.60
Cock's foot	1.59	29.52	17.86
Hard fescue	1.66	31.84	8.17
Meadow soft	1.93	34.83	3.91
Perennial darnel or rye grass	2.15	24.67	13.80
Annual meadow	.59	41.86	.47
Smooth stalked meadow grass	1.65	31.17	11.25
Rough stalked meadow	2.20	29.40	6.90
Common cat's tail	2.26	24.25	.70
Annual rye grass	1.99	28.99	.....

ARTIFICIAL GRASSES.

Common red clover	1.85	36.45	2.39
Purple trefoil	1.58	22.12	....
Cow grass	1.77	34.72	.85
Common vetch	1.11	32.82	3.27
Alsike clover	2.12	29.72	6.29
Lucerne	3.04	9.99	1.54

The ash of some plants contains a large percentage of potash. Liebig mentions a German cultivator who planted wormwood to obtain potash,

and thereby rendered his land incapable of bearing grain for years. It contains, according to Davy, 730 parts of that element in 10,000. In the same quantity of the ashes of fumitory were found 790 parts. Professor Way, in 100 parts of ashes, found potash in the following proportions:

Of the potato	50.88 parts.
Of the red clover hay	14.85 parts.
Of the white clover hay	14.33 parts.
Of the the long red mangold root	21.63 parts.
Of the Skirving's Swede bulb	36.16 parts.

Professor Voelcker thus remarks upon experiments which seemed to prove the value of salts of potash upon potatoes, clover, beets, and turnips:

In several experiments, tried on poor, sandy soils during the past season, the addition of crude potash salts to superphosphate of lime had a very marked and decidedly beneficial effect on the potato crop, and also on Swedes. Even when applied alone, crude potash salts benefit materially root crops growing on poor, sandy land. The same beneficial effect I find, by direct experiments, cannot be obtained by the application of common salt, showing that soda is a much less valuable fertilizing constituent than potash, and incapable of replacing the functions of the latter in the vegetable economy.

Hitherto the price of potash has stood in the way of its being employed on an extended scale in agriculture. Even in its cheapest form—that of crude German potash salts—potash was too dear for practical application in agriculture. But as potash will, no doubt, be extensively used in agriculture, if it can be had at a cheap rate, I have pleasure in directing attention to a mineral called kainite, which is found in the neighborhood of Staufurth, in Saxony, and which, in round numbers, contains 24 per cent. of sulphate of potash and 12 per cent. of sulphate of magnesia. This saline mineral can now be obtained in England, in a finely ground condition, ready for mixing with other artificial manures, at abont £3 3*s.* per ton, and probably less when considerable quantities are required. From three to four hundred-weight of ground kainite, mixed with an equal quantity of superphosphate of lime, per acre, has been found of great utility in the sugar-beet growing districts of North Germany; and I have no doubt will be found equally useful in England, where root crops are intended to be raised upon naturally poor or upon exhausted sandy soils. The crop, however, most likely to be greatly benefited by this potash manure is the potato.

On light soils, I would strongly recommend, as a manure for potatoes, the following mixture: four to five hundred-weight of kainite, (crude German potash,) four hundred-weight of Peruvian guano, and four hundred-weight of superphosphate of lime.

Professor C. W. Johnson thus sums up the results of experiments, instituted at the suggestion of Professor Voelcker, at Escrick Park, in the season of 1869, upon mangolds.

The mangolds were sown on May 11, 1869, on a barley stubble in 1868. The soil of the experimental field was of a light, sandy character, and, though naturally poor, it was in a good agricultural condition, as the produce from the unmanured plot showed.

The mangold crop was taken up, topped, tailed, and weighed on the 11th November, 1869, when the following results were obtained:

Plots of 1-20th of an acre.	Manure per acre.	Produce per acre.		
		Tons.	*cwts.*	*lbs.*
1	No manure	22	10	0
2	Mineral superphosphate, 3 cwts	23	10	0
3	Mineral superphosphate, 3 cwts., and potash salts, 2 cwts	29	5	0
4	Mineral superphosphate, 3 cwts., and Peruvian guano, 1 cwt	26	0	0
5	Peruvian guano, 3 cwts	24	15	0
6	No manure	21	0	0
7	Mineral superphosphate, 3 cwts.; potash salts, 2 cwts; and sulphate of ammonia, 1 cwt	30	5	0
8	Rotten dung, 20 tons	30	10	0
9	Mineral superphosphate, 3 cwts.; potash salts, 2 cwts.; and nitrate of soda, 1 cwt	31	15	0
10	Rotten dung, 10 tons, and mineral superphosphate, 1½ cwt	31	5	0
11	Bone dust, 3 cwts., and mineral superphosphate, 1½ cwt	27	15	0

The preceding tabulated results exhibit several points of interest, on which a few observations may be offered :

1. In the first place it will be seen that the two unmanured portions of the experimental field yielded a fair crop of mangolds. One of these plots produced 22½ tons per acre, and the other 21 tons; or, on an average, the unmanured plots produced 21¾ tons of mangolds per acre. The difference in the weights of the crops on plot 1 and plot 6, is not greater than can be expected in field experiments. The experimental field thus was tolerably uniform in character and well adapted for the trial.

2. Mineral superphosphate alone gave only an increase of 1¾ ton, and thus appears not to be the kind of manure which ought to be employed for mangolds on light land.

3. The addition of two hundred-weight of salts of potash to three hundred-weight of mineral superphosphate proved very successful, inasmuch as it raised the produce to 29¼ tons, and gave an increase of 7½ tons over the average yield of the unmanured portions of the field.

4. In these experiments, the addition of two hundred-weight of salts of potash had a better effect than the addition to superphosphate of one hundred-weight of Peruvian guano, or than three hundred-weight of Peruvian guano alone.

5. Peruvian guano alone answered better than mineral superphoshate applied by itself, but did not appear to be the best artificial manure that can be used on light lands for mangolds.

We may learn from this that neither the exclusive use of a purely mineral phosphatic manure, nor a manure containing, like Peruvian guano, an excess of nitrogenous compounds, produces the best crop of mangolds on light land.

6. A moderate amount of an ammoniacal salt, or of nitrate of soda, added to a manure composed of available phosphates and salts of potash, appeared to be very useful.

The mixture of three hundred-weight of superphosphate, two hundred-weight of salts of potash, and one hundred-weight of nitrate of soda, it will be seen, produced 31¾ tons of mangolds, which, considering the natural poverty of the soil, must be considered a very good crop indeed.

The same mixture, it will also be observed, had a better effect than 20 tons of farmyard manure; for while plot 9 gave an increase of 10 tons over the unmanured plots, 20 tons of rotten dung per acre produced only an increase of 8½ tons.

7. A heavy dressing of dung proved to be less beneficial than the addition of some superphosphate to a moderate dose of dung. The best crop, it will be noticed, was obtained by 10 tons of rotten dung and 1½ hundred-weight of superphosphate.

On the whole, the results obtained at Escrick agree well with those described in the series of experiments which were tried by Mr. Ellis, at Iver Moor. Both sets plainly show that potash salts are very useful to mangolds, and that, in order to obtain the best economic results from their use for this crop, they should be mixed with superphosphate and a small quantity of either sulphate of ammonia or nitrate of soda.

I have repeatedly observed that a small quantity of nitrate of soda helps on the mangold plants in a striking manner, provided other fertilizers are used at the same time, or the land is in a high agricultural condition. The mixture of three hundred-weight of superphosphate, two hundred-weight of salts of potash, and one hundred-weight of nitrate of soda per acre, can be recommended both as an economical and beneficial artificial mangold manure for light land.

The result of these researches will lead to other and more extended experiments with salts of potash. They afford additional evidence of the importance of mixing together our artificial manures, and of avoiding the rapid conclusions at which we are apt to arrive from imperfect examinations. That we have, during the present century, made great advances in our knowledge of artificial fertilizers is an undoubted fact, but then we are well aware that many a vegetable mystery has to be unravelled, many a discovery yet made, before we can conclude that no further advances are to be made in rendering our soils more productive. We are, in all probability, ever treading on the verge of some discovery relating to the food of plants, a knowledge which our former experience tells we are often much nearer to than we are always willing to believe. We have an instance of this in some of the laborious trials of the celebrated Arthur Young. It was in the year 1782, that among many experimental dressings he used various salts of ammonia and of potash; several acids, such as the nitric, the muriatic, and the sulphuric; and also impure varieties of phosphate of lime—as in the dung of poultry. (Annals of Agriculture, vol. 1, p. 150, vol. 3, p. 122.) Had he but mixed some of these together he would have found that superphosphate of lime

which, after the lapse of more than half a century, Liebig first advocated the use of in 1840.

WAGES OF IRISH FARM LABOR.

The following table shows the average rates of wages of farm labor in twenty-eight counties in Ireland, as given by a recent statistical publication:

Counties.	Per week, without food.	Per week, with food.	Per day, without food.	Per day, with food.
Cork	7*s.* to 10*s*	3*s.* to 6*s*		
Limerick	7*s.* to 10*s*	3*s.* to 6*s*		
Carlow	7*s.* 6*d*	4*s*	1*s.* 4*d*	
Kildare	7*s.* 6*d*	4*s*	1*s.* 4*d*	
Waterford	7*s.* to 10*s*	3*s.* to 6*s*		
Kilkenny	7*s.* 6*d*	4*s*	1*s.* 4*d*	
Cavan	6*s.* to 10*s*		1*s.* to 2*s*	3*d.* to 10*d.*
King's	6*s.* to 8*s.*		1*s.* to 1*s.* 6*d*	
Meath	7*s.* 6*d*	4*s*	1*s.* 4*d*	
Queen's	7*s.* 6*d*	4*s*	1*s.* to 1*s.* 6*d*	
Wexford	7*s.* 6*d*	4*s*	1*s.* 4*d*	
Roscommon	6*s.* to 8*s*		1*s.* to 1*s.* 6*d*	
Longford	6*s.* to 8*s*		1*s.* to 1*s.* 6*d*	
Clare	7*s.* to 8*s*		1*s.* 6*d.* to 2*s*	
Galway	7*s.* to 8*s*		1*s.* 6*d.* to 2*s*	
Tipperary	7*s.* 6*d*	5*s*		
Leitrim	6*s*		1*s.* to 2*s*	
Kerry	7*s.* to 8*s*		1*s.* 6*d.* to 2*s*	
Dublin	6*s.* to 10*s*		1*s.* to 2*s*	
Fermanagh	6*s.* to 10*s*		1*s.* to 2*s*	
West Meath	6*s.* to 10*s*		1*s.* to 2*s*	
Monaghan	6*s.* to 10*s*		1*s.* to 2*s*	
Sligo	6*s*		1*s.* 6*d.* to 2*s*	
Mayo	6*s*		1*s.* 6*d.* to 2*s*	
Armagh, Down, Londonderry, Tyrone	£5 to £10 for the half year.			

Statement of the population and area, and of the acreage under crops and grass for hay, in various British colonies. (The acreage and area are stated in English statute acres.)

Description of crops, &c.	New South Wales.		Victoria.		South Australia.		Western Australia.		Queensland.		Tasmania.		New Zealand.		Natal.		Cape of Good Hope.
Population	447, 620		696, 161		172, 860		22, 733		107, 427		98, 455		218, 668		250, 808		566, 158
Total area	206, 999, 680		55, 571, 840		245, 329, 920		640, 000, 000		433, 920, 000		16, 777, 600		68, 005, 760		10, 332, 800		128, 390, 400
Years	1866–'67	1867–'68	1867–'68	1868–'69	1866–'67	1867–'68	1867	1868	1867	1868	1866	1867–'68	1867–'68	1868–'69	1866	1867	1865
Total acreage under crops and grass, &c.	452, 850	413, 164	631, 207	710, 024	739, 714	810, 734	45, 519	50, 014	31, 559	39, 321	167, 866	172, 393	770, 872	783, 435	110, 372	121, 723	460, 754
GRAIN CROPS.																	
Wheat	175, 034	149, 142	216, 989	258, 428	457, 628	550, 456	25, 821	30, 323	2, 657	3, 425	71, 348	64, 020	47, 774	64, 317	1, 859	2, 563	202, 257
Barley and bere	6, 211	5, 141	15, 982	19, 189	11, 723	13, 816	4, 207	4, 243	114	172	4, 596	6, 860	13, 136	15, 427	206	314	34, 369
Oats	14, 914	13, 143	125, 345	115, 177	3, 909	4, 846	1, 628	1, 623	482	95	34, 558	27, 574	101, 555	85, 056	1, 148	1, 575	99, 609
Rye	1, 572	1, 879	1, 376	2, 407	.....	.....	990	1, 045	.....	.....	.....	.....	1, 052	.....	.....	.....	24, 330
Beans and peas	.....	.....	3, 658	3, 623	1, 853	3, 499	.....	7	.....	.....	4, 163	5, 067	4, 387	.....	245	511	8, 784
Buckwheat	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	112	112	.....
Maize	119, 519	115, 523	579	860	.....	.....	82	115	10, 599	12, 339	.....	.....	2, 523	.....	63, 260	82, 618	50, 126
Other kinds of grain	197	200	.....	.....	.....	.....	.....	.....	108	101	.....	.....	.....	.....	22, 155	25, 309	.....
Total under grain crops	317, 447	285, 028	363, 929	399, 684	475, 113	572, 617	32, 728	37, 356	13, 960	16, 132	114, 465	103, 521	.....	.....	88, 985	113, 002	419, 675
Potatoes	18, 810	15, 440	35, 831	36, 407	2, 526	2, 701	422	439	1, 913	2, 027	10, 520	10, 766	14, 345	11, 557	2, 564	2, 081	12, 845
Cotton	.....	76	.....	.....	.....	.....	.....	.....	8, 149	11, 454	.....	.....	.....	.....	1, 262	670	.....
Sugar cane	116	647	.....	.....	.....	.....	.....	.....	1, 995	3, 397	.....	.....	.....	.....	12, 796	4, 282	.....
Tobacco	1, 326	627	229	168	.....	.....	.....	.....	8	24	216	151	165	.....	164	102	1, 974
Vineyards	2, 281	2, 532	4, 340	3, 998	6, 361	6, 209	674	668	194	334	.....	.....	.....	.....	.....	.....	16, 177
Bare fallow	.....	.....	33, 452	55, 466	130, 301	119, 481	.....	.....	.....	.....	.....	18, 805	94, 304	96, 420	.....	.....	.....
Grass for hay	74, 743	74, 346	108, 373	111, 796	111, 339	97, 432	11, 075	10, 999	2, 041	2, 340	33, 762	33, 064	27, 160	26, 696	.....	.....	.....

FACTS FROM VARIOUS SOURCES.

THE RECLAMATION OF SALT MARSHES.—Mr. S. N. Pike, who is engaged in reclaiming salt marshes in Hudson County, New Jersey, in a recent note to the Department, states that 4,000 acres are nearly drained and reclaimed. About 500 acres are now plowed, of which 200 acres are under cultivation this season. The experimental crops last year, consisting of tobacco, corn, oats. cabbage, potatoes, and several varieties of garden produce, proved entirely successful, and fully assured the opinion he had originally formed respecting the fertility and productiveness of these lands. The plan which Mr. Pike has thus far carried out, includes the construction of substantial dikes or banks to protect the land from tidal overflow and percolation, a thorough system of drainage, to relieve the land in the first instance of the standing water, and subsequently of any excess of rain-fall, together with permanent self-acting sluices, which discharge at low tide. The first breaking up is accomplished with difficulty; yet, in one season, by natural action of the atmosphere, sun, rain, frost, and the equally potent influence of the plow, the whole body of the land will be changed to a rich permeable soil open to the highest cultivation.

Twitchell Island, California, recently reclaimed by the Tide Land Reclamation Company, has been sold to a company of practical Kentucky farmers, who intend cultivating and using the land for stock and dairy purposes. The sale was made at $20 per acre.

IMPORTS OF GUANO.—During the quarter ended March 31, 1870, there was received at the ports named, guano from islands, rocks, or keys appertaining to the United States, and admitted free of duty, as follows:

Received at—	Where from.	Tons.	Value.
Baltimore, Maryland	Navassa Island	3,453	$55,250
Wilmington, North Carolina	Navassa Island	921	18,020
Philadelphia, Pennsylvania	Sombrero Island	1,425	17,527
Savannah, Georgia	McKean and Howland Islands	5,476	212,790
		11,275	303,587

For the nine months ended March 31, 1870, the receipts of guano from other than American islands, and subject to duty, amounted to 26,975 tons, against 7,365 for corresponding period of 1869.

MAINE LUMBER.—The amount of lumber, &c., the product of the State of Maine, upon the St. John and the St. Croix Rivers, and their tributaries, owned by American citizens, and sawed and hewn in the province of New Brunswick by American citizens, and admitted free of duty during the quarter ended March 31, 1870, is reported as follows:

	M feet.	Value.
Boards, clap-boards, deals, planks, joists, and scantling	4,005	$73,007
Laths, palings, pickets, curtain sticks, broom handles, bed slats	1,962	8,360
Shingles	565	1,028
Other shooks and staves, and headings		1,448
All other lumber		82
	6,532	83,925

SILK CULTURE IN CALIFORNIA.—Albert Brewster, a sericulturist of Los Angeles, is feeding his worms with branches this season, thus saving the labor of pulling the leaves. He says this season has been more favorable than the last. The worms have been longer in maturing than if the weather had been warmer, but they could not be more healthy. About 60,000 of his worms had commenced to spin their cocoons the remainder, 200,000, are yet small, being more recently hatched.

In Santa Barbara County, California, Mr. A. Packard has five acres in mulberry trees, eight years old, planted at 10 by 18 feet distance. Mr. J. E. Goux also has a plantation of the same size and age, planted 20 by 20 feet distance. Dr. James Ord has a similar plantation.

The California State Board of Agriculture have awarded State premiums to Mrs. E. M. Weston, of Sacramento, for 625,000 silk cocoons; A. Packard, of Santa Barbara, for 150,000 cocoons; H. G. Bollow, of Yolo County, for 100,000 cocoons; and to several parties for mulberry plantations.

TEXAS CATTLE.—There has recently been established at Schuyler, Nebraska, on the Union Pacific railroad, seventy-five miles west of Omaha, a depot for the sale of Texas cattle. 12,000 to 15,000 are now at this point on their way to the eastern markets. The Kansas Pacific railway is sending forward 600 head of cattle each day. It is stated that there are now about 50,000 head in the vicinity of Abilene, awaiting shipment and sale, and that 200,000 head of Texas cattle have crossed the Red River.

SOUTH AMERICAN CATTLE IN ENGLAND.—Alfred Fox, United States consul at Falmouth, England, in a recent letter to this Department, writes as follows:

The farmers here appear to be paying increased attention to the breeding and fattening of cattle as an important source of profit. A steamer has lately landed here, in fair condition, with a few exceptions, from Montevideo, 142 oxen, which cost about £4 per head on board at Montevideo; 6 cows, which cost about £3 per head; 5 calves, which go with the cows; 297 sheep, which cost about 5s. per head; and 6 horses, which cost about £4 per head.

About 70 oxen were killed on the voyage, owing, as was alleged, to injuries sustained by the rough manner in which they were put on board, to the length of the voyage, (forty-three days,) to the high temperature at Bahia, where the steamer called to repair machinery, and to the want of experience in the requirements on board in this the first experiment. Such a traffic might perhaps be advantageously carried on between Montevideo and the United States.

It is the invariable practice in this county to make butter from clotted cream, which is generally produced by placing the pan of milk over a hot iron plate, but it must not be allowed to boil. The cream becomes very rich and of a greater consistency, and is also largely used with ripe strawberries, raspberries, fruit pies, &c. This plan is supposed to have been introduced here by the Phœnicians, who are said to have visited Cornwall three thousand years ago in quest of tin.

A BOARD OF AGRICULTURE FOR NEW HAMPSHIRE.—The legislature of this State has passed a bill establishing a board of agriculture, to consist of one member from each county, to be nominated by the governor and confirmed by the council. It is made the duty of the board to investigate subjects in relation to agriculture and kindred arts; to cause to be analyzed samples of commercial fertilizers offered for sale in the State; to collect and distribute grains and other seeds, &c. Returns are to be secured from all parts of the State, and an annual report is to be issued, to be distributed as other public documents. The members of the board are to receive no compensation beyond necessary expenses.

TRICHINÆ IN OREGON.—It is stated in the Oregonian that a party of French, who had camped at Wilhoit's Soda Springs, killed a deer which was found to be literally alive with trichinæ. A number of families ate of it before the discovery. The trichinæ were first noticed in the ham, and, upon closer observation, in every part of the animal. The discovery of trichinæ in venison killed in its "mountain fastness" has created quite an excitement among the hunters.

WOOL IN COLORADO.—A Colorado correspondent writes that the establishment of a woolen factory at Denver has already stimulated wool-growers to the introduction of thorough-bred Cotswold and Southdown bucks to cross with the native sheep.

METEOROLOGY.

[COMPILED IN THE DEPARTMENT OF AGRICULTURE FROM REPORTS MADE BY THE OBSERVERS OF THE SMITHSONIAN INSTITUTION.

Table showing the highest and lowest range of the thermometer, (with dates prefixed,) the mean temperature, and amount of rain-fall, (in inches and tenths,) for June, 1870, as reported by the observers at the stations named. Observations daily at 7 a. m. and 2 and 9 p. m. Tables from reports received up to July 15th—notes from reports received up to July 13th.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date.	Minimum temperature.	Mean temperature.	Rain-fall.
MAINE.				°		°	°	*In.*
Houlton	Aroostook	Chas. H. Fernald	5	97	1	54	70.1	2.40
Orono	Penobscot	M. C. Fernald	25	89	10	53	65.7	2.07
Surrey	Hancock	Oscar H. Tripp	25	90	9, 10	54	67.6	.....
Williamsburg	Piscataquis	Edwin Pitman	24, 25	89	12, 21	50	67.1	2.70
West Waterville	Kennebec	B. F. Wilbur	4, 25	90	10, 11	52	69.2	1.38
Gardiner	do	R. H. Gardiner	25	88	10	47	65.9	1.94
Lisbon	Androscoggin	Asa P. Moore	25	96	3, 9, 10	51	67.1	3.23
Norway	Oxford	Howard D. Smith	24	94	21	50	69.5	1.50
Cornish	York	Silas West	24	95	9, 10	50	68.9	3.97
Cornishville	do	G. W. Guptill	25	96	9, 10	52	71.0	3.40
Averages							68.2	2.95
NEW HAMPSHIRE.								
Stratford	Coos	Branch Brown	5, 24	92	21	48	66.3	1.63
Whitefield	do	L. D. Kidder	24	92	21	51	69.5	4.56
Tamworth	Carroll	Alfred Brewster	25	95	29	53	70.5	2.63
Goffstown Center	Hillsborough	Alfred Colby	25	100	10, 11	50	70.2	4.19
Averages							69.1	3.25
VERMONT.								
Lunenburg	Essex	H. A. Cutting, A. M	29	94	22	50	69.4	3.50
North Craftsbury	Orleans	Rev. E. P. Wild	25	98	20, 21, 22	50	68.8	3.73
Newport	do	J. M. Currier	5	91	21	53	71.5	4.30
East Bethel	Orange	Chas. S. Paine	25	95	21, 22, 30	55	71.8	3.45
Woodstock	Windsor	Doton and Miller	25	89	10, 21	52	68.0	5.35
Near St. Albans	Franklin	A. H. Gilmour	24	89	21	53	72.1	2.50
West Charlotte	Chittenden	Miss M. E. Wing	25	96	22	57	74.3	6.93
Middlebury	Addison	H. A. Sheldon	25	85	22	55	70.9	3.77
Panton	do	D. C. and M. E. Barto	24, 25	94	21	54	75.3	4.36
Castleton	Rutland	Rev. R. G. Williams	25	90	22	55	71.8	1.97
Averages							71.4	3.99

Table showing the highest and the lowest range of the thermometer, &c.—Continued.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date.	Minimum temperature.	Mean temperature.	Rain-fall.
MASSACHUSETTS.				°		°	°	*In.*
Kingston	Plymouth	G. S. Newcomb	25	95	21	53	68.9	2.00
Lawrence	Essex	John Fallon	25	99	10	48	68.9	3.49
Milton	Norfolk	Rev. A. K. Teele	25	98	10, 11	54	70.1	2.60
Cambridge	Middlesex	Rev. & Mrs. J B. Perry.	25	96	11	53	72.3	.....
North Billerica	....do	Rev. E. & W. W. Nason	25	95	11	52	71.0	.....
West Newton	....do	Jno. H. Bixby	25	104	11	52	73.8	7.96
New Bedford	Bristol	Sam'l Rodman	25	90	21	54	66.7	3.48
Mendon	Worcester	Jno. G. Metcalf, M. D.	25	92	10	49	69.1	3.40
Lunenburg	....do	Geo. A. Cunningham	25	97	10	50	71.0	3.80
Amherst	Hampshire	Prof. E. S. Snell	25	93	10, 11	54	70.5	2.73
Richmond	Berkshire	Wm. Bacon	20	92	13	59	73.8	9.86
Williams College	....do	Prof. A. Hopkins	25, 27	89	22	54	70.0	5.05
Hinsdale	....do	Rev. E. Dewhurst	27	89	10, 11	48	69.0	5.80
Averages							70.4	4.56
RHODE ISLAND.								
Newport	Newport	W. A. Barber	25, 28	86	11, 22	58	68.2	2.11
CONNECTICUT.								
Columbia	Tolland	Wm. H. Yeomans	25	95	10	54	71.9	3.55
Middletown	Middlesex	Prof. Jno. Johnston	24, 25	95	11	53	71.8	2.72
Southington	Hartford	Luman Andrews	25	92	11	52	72.7	4.35
Colebrook	Litchfield	Charlotte Rockwell	25	90	10, 11	53	70.3	7.06
Brookfield	Fairfield	Rev. S. W. Roe	25	94	2, 7, 10 / 11, 22	60	71 2	4.60
Averages							71.6	44.6
NEW YORK.								
Moriches	Suffolk	E. A. Smith & daugh'rs	28	102	10	58	71.9	1.12
South Hartford	Washington	G. M. Ingalsbe	27	94	22	57	75.4	3.35
Garrison's	Putnam	Thos. B. Arden	25, 28	92	11	56	72.5	3.00
Throg's Neck	West Chester.	Miss E. Morris	25	93	11	56	71.9	.....
White Plains	....do	Prof. G. R. Willis & dau	28	89	11	57	72.2	.....
Cooper Union	New York	Prof. O. W. Morris	25	93	11	57	74.1	2.85
Rutger's Fem. Col	....do	Mrs. M. M. Marsh	25	95	10, 11	60	76.7	1.02
Flatbush	Kings	Rev. Eli T. Mack	25	93	10	55	75.1	1.73
Brooklyn	....do	Isaac P. Mailler	25, 28	96	11	59	74.7	3.38
Glasco	Ulster	D. B. Hendricks	25	93	3	52	73.4	3.13
Newburg	Orange	Jas. H. Gardiner	25	95	10	59	75.4	4.63
Minaville	Montgomery	J. W. Bussing	28	95	22	53	74.3	3.50
Bannerville	Schoharie	G. S. France	27	100	10	57	74.3	4.00
Cooperstown	Otsego	G. Pomeroy Keese	27	92	22	52	72.5	0.95
Gouverneur	St. Lawrence	C. H. Russell	25	90	21	50	70.7	3.50
North Hammond	....do	C. A. Wooster	25	95	21, 22	60	78.4	0.97
Houseville	Lewis	Walter D. Yale	25, 27	92	21	53	72.8	0.80
Utica	Oneida	J. Gilbert Williams	28	94	22	53	73.7	3.29
South Trenton	....do	Storrs Barrows	28	94	6	50	71.2	3.87
Cazenovia	Madison	Prof. Wm. Soule	27	92	22	55	71.2	.....
Oneida	....do	S. Spooner, M. D	28	93	21	53	72.8	4.59
Depauville	Jefferson	Henry Haas	28	90	22	53	70.8	2.27
Oswego	Oswego	Wm. S. Malcom	3	82	21	55	68.3	2.15
Palermo	....do	E. B. Bartlett	25	92	21	52	71.6	0.70
North Volney	....do	J. M. Patrick	25, 27	93	21	53	72.9	.....

Table showing the highest and the lowest range of the thermometer, &c.—Continued.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date.	Minimum temperature.	Mean temperature.	Rain-fall.
NEW YORK—Con'd.				°		°	°	*In.*
Waterburg	Tompkins	D. Trowbridge	25	34	21	49	72.6	.....
Nichols	Tioga	Rob't Howell	25	95	21	50	71.5	.....
Newark Valley	....do	Rev. Sam'l Johnson	25	94	21, 22	50	70.9	3.40
Himrods	Yates	Gilbert D. Baker	25,26,27	89	21	52	70.4	2.69
Little Genesee	Alleghany	Dan'l Edwards	25	94	22	48	69.3	4.57
Lockport	Niagara	B. Wheaton Clark	26	91	21	56	70.8	4.37
Buffalo	Erie	Wm. Ives	29	95	21	55	70.5	6.30
Averages							72.7	2.93
NEW JERSEY.								
Paterson	Passaic	Wm. Brooks	20	95	10	57	74.4	4.20
Newark	Essex	W. A. Whitehead	28	93	11	55	72.3	3.13
Trenton	Mercer	E. R. Cook	26	94	1, 10, 11	62	77.2	3.27
Rio Grande	Cape May	Mrs. J. R. Palmer	26, 30	96	2, 3	60	74.0	3.25
Moorestown	Burlington	Thos. J. Beans	28	95	4	57	73.3	2.80
New Germantown	Hunterdon	A. B. Noll	28	93	11	58	73.0	5.56
Haddonfield	Camden	John Boadle	28	92	1	59	73.0	2.80
Newfield	Gloucester	E. D. Couch	19	100	1	61	76.0	.....
Greenwich	Cumberland	Miss R. C. Sheppard	26, 29	92	2	61	74.1	2.38
Vineland	....do	John Ingraham, M. D	29	99	1	57	76.1	4.32
Averages							74.3	3.52
PENNSYLVANIA.								
Hamlinton	Wayne	Jas. D. Stocker	27	91	21	52	70.9	4.65
Dyberry	....do	Theodore Day	28	96	21, 22	52	69.4	2.90
Fallsington	Bucks	Eben'r Hance	26, 28	94	10, 11	60	74.7	3.60
Philadelphia	Philadelphia	Prof. J. A. Kirkpatrick	28	94	11	61	76.4	2.54
Germantown	....do	Thos. Meehan	25,26,28	96	22	60	75.7	.....
Do	....do	Ernest Turner	28, 29	94	7	57	74.3	2.36
Horsham	Montgomery	Miss Anna Spencer	28	91	1	58	72.1	4.25
Plymouth Meeting	....do	M. H. Corson	28	92	1, 22	59	73.2	3.40
White Hall	Lehigh	Edw'd Kohler	29	93	22	53	74.0	.....
Factoryville	Wyoming	Rodman Sisson	27	94	22	54	71.0	4.92
Reading	Berks	J. Heyl Raser	26	94	22	61	74.6	5.69
West Chester	Chester	Geo. Martin, M. D	29	95	11	59	73.9	6.15
Parkersville	....do	F. Darlington, M. D	29	96	1, 11	60	74.5	5.60
Tamaqua	Schuylkill	John Haworth	27	91	21	47	69.9	8.30
Catawissa	Columbia	A. Curtis	27	94	21	52	69.8	.....
Ephrata	Lancaster	W. H. Spera	19,24,27, 28, 29	94	11	58	72.0	4.73
Carlisle	Cumberland	Wm. H. Cook, M. D	26	96	12	57	74.3	7.80
Fountain Dale	Adams	S. C. Walker	26	94	11	57	72.5	6.70
Tioga	Tioga	E. T. Bentley	27	94	22	48	70.6	3.30
Lewisburg	Union	Prof. C. S. James	26, 28	93	1	52	72.2	5.17
Grampian Hills	Clearfield	Elisha Fenton	24,25,28	92	11, 22	50	68.0	2.83
Johnstown	Cambria	David Peeler	25	92	21	52	67.8	4.02
Franklin	Venango	Rev. M. A. Tolman	27	95	22	52	70.3	5.60
Pittsburg	Alleghany	George Albree	26	91	11	56	71.3	3.40
Connellsville	Fayette	John Taylor	26, 27	98	11	50	72.6	.....
Brownsville	....do	J. Allen Hubbs, M. D	27	92	9, 22	60	75.0	.....

Table showing the highest and the lowest range of the thermometer, &c.—Continued.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date.	Minimum temperature.	Mean temperature.	Rain-fall.
PENNSYLV'A—Con.				°		°	°	*In.*
New Castle	Lawrence	E. M. McConnell	26	90	22	51	72.1	4.09
Beaver	Beaver	Rev. R. T. Taylor	26	89	10, 12, 13, 21	57	69.5	6.00
Canonsburg	Washington	Rev. Wm. Smith, D. D.	26, 27	93	22	52	70.6	2.83
Averages							72.5	4.65
MARYLAND.								
Woodlawn	Cecil	Jas. O. McCormick	28	94	22	58	73.1	5.87
Annapolis	A. Arundel	Wm. R. Goodman	28	96	2	62	76.6	4.38
Mt. St. Mary's	....do	Prof. C. H. Jourdan	26	92	12	55	71.4	9.60
Averages							73.7	6.60
DIST. COLUMBIA.								
Washington	Washington	Smithsonian Instit'n	28	93	2	63	75.0	4.45
VIRGINIA.								
Johnsontown	Northampton	C. R. Moore	28	94	1	58	74.6	3.20
Hampton	Elizab'th City	Jas. M. Sherman	26, 28	98	1, 3	64	76.5	7.70
Zuni Station	Isle of Wight	Rob't Binford	26	98	12	64	78.5	5.02
Surry C. H	Surry	B. W. Jones	28	102	1, 3, 4, 11	68	80.7	6.06
Comorn	King George	E. Tayloe	28	92	1	64	76.0	4.75
Vienna	Fairfax	J. B. Bowman	27, 28	98	1	64	77.5	.....
Do	....do	H. C. Williams	26, 28	91	11	60	73.6	4.07
Piedmont	Fauquier	Franklin Williams	26, 28	94	11	57	62.6	6.81
Staunton	Augusta	J. C. Covell	24, 25	89	11	56	71.8	6.73
Lexington	Rockbridge	Rev. W. H. Ruffner	27	99	11, 12	58	74.5	3.60
Lynchburg	Bedford	Chas. I. Meriwether	27	90	12	58	73.4	.....
Snowville	Pulaski	J. W. Stalmaker	27	92	11	51	68.9	6.10
Wytheville	Wythe	Rev. Jas. A. Brown	24, 25, 26	86	9, 11	56	68.0	5.80
Averages							73.4	5.44
WEST VIRGINIA.								
Weston	Lewis	B. Owen	26, 27	95	6	48	70.2	.....
Cabell C. H	Cabell	C. L. Roffe	28	98	11	48	75.0	4.70
NORTH CAROLINA.								
Goldsboro'	Wayne	E. W. Adams, A. M.	27	103	4	59	80.1	7.95
Oxford	Granville	W. R. Hicks, M. D	28	96	2, 3	63	75.9	2.10
Albemarle	Stanley	F. J. Kron	28	100	11	56	74.8	3.17
Asheville	Buncombe	J. T. E. Hardy, M. D.	23, 24, 26, 30	80	10, 14	52	67.2	.....
Averages							74.5	4.41
SOUTH CAROLINA.								
Gowdeysville	Union	Charles Petty	.....	.....	11	62	75.6	3.18
Bluffton	Beaufort	J. St. J. Guerard, M. D.	26	95	2, 9, 10, 19	71	79.8	9.30
Fort Mill	York	R. A. Springs, jr	30	94	12	60	75.1	.....
Averages							76.8	6.24

Table showing the highest and the lowest range of the thermometer, &c.—Continued.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date.	Minimum temperature.	Mean temperature.	Rain-fall.
GEORGIA.				°		°	°	*In.*
Berne	Camden	H. L. Hillyer	30	91	10, 12, 13	68	76.9	5.68
St. Mary's	....do	Ebenezer Barker	30	91	11	68	78.0	.....
Penfield	Greene	S. P. Sanford	28	94	10, 11	60	75.7	2.66
Atlanta	Fulton	F. Deckner and son	27	96	10, 11	51	71.4	4.56
Averages							75.5	3.27
ALABAMA.								
Carlowville	Dallas	H. L. Alison, M. D.	27	96	11	66	78.2	6.99
Coatopa	Sumter	S. K. Jennings, M. D	27	95	13	59	75.2	5.20
Averages							76.7	6.10
FLORIDA.								
Jacksonville	Duvall	A. S. Baldwin, M. D	28	95	10, 11, 12	71	79.2	3.10
Pilatka	Putnam	Gen. G. D. Robinson	26, 27, 29, 30	98	13	72	81.1	7.80
Ocala	Marion	Edward Barker	3, 28	95	10	65	80.2	.....
Orange Grove	Manatee	W. J. Clarke	24, 25	90	10	71	80.5	5.40
White Spring	Hamilton	R. W. Adams	27	96	11	67	80.7	.....
Newport	Wakulla	Charles Beecher	6	92	10	69	77.8	6.88
Chattahoochie	Gadsden	M. Martin	27	95	7	66	.....	6.50
Averages							79.9	6.94
TEXAS.								
Oakland	Colorado	F. Simpson	6, 7	95	13	70	80.6	5.00
Lavacca	Calhoun	L. D. Heaton	12	92	10	72	81.4	0.40
Bluff	Fayette	Joseph Fietsam	4, 6	94	9, 10, 13	72	81.4	3.24
Clinton	De Witt	A. C. White, M. D	15 30	98	10, 18	72	82.4	1.75
Austin	Travis	J. Van Nostrand	27	91	9	64	78.8	2.60
San Antonio	Bexar	F. Pettersén, M. D	5, 6, 15	100	9	66	81.3	3.28
Averages							81.0	2.71
LOUISIANA.								
New Orleans	Orleans	Robt. W. Foster	3, 4, 28, 29	89	10, 13	68	77.6	2.30
Cheneyville	Rapides	R. S. Jackson	4, 30	90	14	68	79.4	.....
Averages							78.5	2.30
ARKANSAS.								
Helena	Phillips	O. F. Russell	22	94	8, 11, 12	60	76.5	.....
MISSISSIPPI.								
Columbus	Lowndes	James S. Sull	30	93	10	61	77.3	3.39
Enterprise	Clark	Rev. E. S. Robinson	28	103	16	60	83.5	5.20
Philadelphia	Neshoba	L. A. Bowden	29, 30	90	13	58	74.2	5.30
Brookhaven	Lawrence	F. B. Moore	22, 30	90	13, 20	60	76.5	3.09
Near Brookhaven	....do	Mrs. W. E. A. Keenan	28, 29, 30	97	12	58	77.4	4.40
Averages							77.8	4.26

Table showing the highest and the lowest range of the thermometer, &c.—Continued.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date.	Minimum temperature.	Mean temperature.	Rain-fall.
TENNESSEE.								
				°		°	°	*In.*
Elizabethton	Carter	Chas. H. Lewis	26, 27	94	10, 11, 13	54	71.4	14.15
Lookout Mountain	Hamilton	Rev. C. F. P. Bancroft.	22, 23, 25, 26, 28	88	10	54	74.3	.....
McMinnville	Warren	T. P. Wright	22, 23	89	10, 11	55	70.5	.....
Austin	Wilson	P. B. Calhoun	24, 25, 26, 27	91	10, 11, 13	56	69.5	8.90
Clarksville	Montgomery	Prof. Wm. M. Stewart.	23	88	11	53	70.8	8.11
Trenton	Gibson	W. T. Grigsby	23	93	11	53	74.5	5.60
Averages							71.8	9.19
KENTUCKY.								
Pine Grove	Clarke	S. D. Martin, M. D.	25	92	9, 11	54	71.4	3.64
Shelby City	Boyle	Howard Shriver	25	92	12	59	73.9	5.50
Louisville	Jefferson	Mrs. L. Young	24, 25	94	10	52	73.1	2.97
Averages							72.8	4.04
OHIO.								
Salem	Columbiana	J. E. Pollock	26, 27	95	21	52	70.4	4.04
Steubenville	Jefferson	Joseph B. Doyle	25	90	22	53	74.0	4.33
Painesville	Lake	E. J. Ferris	25, 26, 30	89	10	54	69.1	6.75
Milnersville	Guernsey	Rev. D. Thompson	25	93	22	48	70.3	4.26
Cleveland	Cuyahoga	Mr. & Mrs. G. A. Hyde.	26	91	10, 12	52	68.3	2.38
Wooster	Wayne	William Hoover	26	102	12	56	73.9	.....
Adams' Mills	Muskingum	Charles A. Stilwell	26	94	11	55	71.8	3.65
Pennsville	Morgan	T. J. Kingman	24, 25, 27	92	11, 12	53	71.6	2.60
Kelley's Island	Erie	Geo. C. Huntington	26	93	10	60	73.1	3.85
Sandusky	....do	Thomas Neill	25, 26, 28	90	10	59	73.1	5.69
North Fairfield	Huron	O. Burrass	26	92	11	54	69.6	2.91
Gambier	Knox	W. B. French	26, 28	89	11	51	68.0	2.93
Westerville	Franklin	Prof. John Haywood	26, 28, 30	94	10	50	73.1	3.77
North Bass Island	Ottawa	Geo. R. Morton, M. D.	28	97	9, 21	59	72.5	2.74
Marion	Marion	H. A. True, M. D	26	93	11	54	70.3	5.14
Hillsboro'	Highland	J. McD. Mathews, M.D.	25	92	11, 12	54	69.9	3.27
Toledo	Lucas	J. B. Trembly, M. D.	25	98	11	55	72.6	4.06
Bowling Green	Wood	John Clarke	28	102	11	54	74.5	3.20
Kenton	Hardin	C. H. Smith, M. D.	26	101	12, 14, 16	60	77.1	5.51
Urbana University	Champaign	M. G. Williams	26	93	10, 11	54	71.0	2.47
Springfield	Clark	G. P. Hachenberg, M.D.	26	96	11	54	73.5	2.20
Bethel	Clermont	Geo. W. Crane	25, 28	93	11	53	60.3	3.13
Jacksonburg	Butler	I. B. Owsley, M. D.	24, 25	96	11, 13	52	72.5	3.25
Mt. Auburn Inst'e	Hamilton	Prof. I. H. White	26	92	11	55	74.3	4.76
Cincinnati	....do	G. W. Harper	25	97	11	55	73.1	4.84
Do	....do	R. C. Phillips	25	95	10	58	76.7	4.25
College Hill	....do	John W. Hammitt	28	97	10	50	73.0	4.31
Averages							71.9	3.86
MICHIGAN.								
Detroit	Wayne	F. W. Higgins	28	96	10, 11	53	69.5	3.07
Monroe City	Monroe	Miss H. I. Whelpley	28	93	11	56	73.6	4.55

Table showing the highest and the lowest range of the thermometer, &c.—Continued.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date	Minimum temperature.	Mean temperature.	Rain-fall.
MICHIGAN—Cont'd.				°		°	°	*In.*
Ann Arbor	Washtenaw	Mrs. N. H. Winchell	25, 30	95	11	52	70.8	2.95
Alpena	Alpena	J. W. Paxton	26	80	11	44	62.6	3.11
Litchfield	Hillsdale	R. Bullard	24, 30	92	10	50	69.1	5.45
Coldwater	Branch	N. L. Southworth	24	96	8	52	68.7	4.31
Grand Rapids	Kent	E. S. Holmes, D. D. S.	27	102	10	53	73.1	3.66
Northport	Lenawee	Rev. Geo. N. Smith	27	93	9, 12	48	66.3	3.50
Otsego	Allegan	Milton Chase, M. D	25	106	9	48	70.9	.....
Copper Falls	Keweenaw	S. H. Whittlesey, M. D	23	91	9, 10	41	64.7	1.00
Ontonagon	Ontonagon	Edwin Ellis, M. D	22, 24, 28, 29	90	12	48	67.6	.....
Averages							68.8	3.58
INDIANA.								
Aurora	Dearborn	Geo. Sutton, M. D	24, 25	100	10, 11, 13	54	71.0	3.01
Vevay	Switzerland	Chas. G. Boerner	25	95	10	56	72.8	3.80
Mt. Carmel	Franklin	J. A. Applegate and daughter.	25	94	11	54	73.0	3.80
Spiceland	Henry	Wm. Dawson	25	96	10	51	72.6	5.36
Laconia	Harrison	Adam Crozier	25	93	10, 11, 12	56	72.9	2.06
Knightstown	Rush	D. Deem	25	98	11	52	72.9	6.12
Near La Porte	La Porte	F. J. Andrew	30	97	9, 11, 13	55	72.2	3.26
Rensselaer	Jasper	J. H. Loughridge	29	98	11	53	73.3	6.85
Merom	Sullivan	Thomas Holmes	25	98	10	53	73.9	2.75
New Harmony	Posey	John Chappellsmith	24, 30	94	11	55	74.2	3.94
Averages							72.9	4.09
ILLINOIS.								
Chicago	Cook	J. G. Langguth, jr	30	100	8	54	71.8	1.70
Near Chicago	do	Sam'l Brookes	30	100	8, 11, 13	54	68.9	.....
Evanston	do	Prof. Oliver Marcy	30	97	8	52	63.1	1.37
Marengo	McHenry	J. W. James	30	100	11	45	69.8	0.99
Charleston	Coles	Charles Gramesley	25, 30	94	9, 10	53	72.7	2.86
Mattoon	do	W. E. Henry	24, 25	93	9	54	73.3	3.38
Aurora	Kane	A. Spaulding, M. D	24	99	10	50	68.4	1.16
Louisville	Clay	D. H. Chase, M. D	25	99	10	52	73.1	4.30
Golconda	Pope	Wm. V. Eldredge	27	99	15	44	73.0	3.70
Belvidere	Boone	G. B. Moss	30	100	9	51	70.1	0.54
Ottawa	La Salle	Mrs. E. H. Merwin	28	105	9	55	75.3	1.39
Decatur	Macon	Timothy Dudley	29	94	9, 12	54	73.0	1.50
Pana	Christian	Thos. Finley, M. D	24, 30	96	12	52	73.8	1.30
Winnebago	Winnebago	J. W. and Miss Tolman	24, 25	99	8, 11, 12	50	71.4	2.12
Rochelle	Ogle	Dan'l Carey	27	100	11, 12	50	70.5	.....
Wyanet	Bureau	E. S. and Miss I. G. Phelps.	24	104	7	46	73.0	0.70
Tiskilwa	do	Verry Aldrich	24, 30	102	11	50	73.0	.....
Hennepin	Putnam	Smiley Shepherd	24, 27, 29, 30	100	10, 12	46	71.0	.....
Do	do	Ethan Osborn	30	104	10	47	74.3	.....
Elmira	Stark	O. A. Blanchard	30	100	12	50	75.0	0.38
Peoria	Peoria	Fred'k Brendel	30	100	9, 12, 13	56	74.6	0.75

Table showing the highest and the lowest range of the thermometer, &c.—Continued.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date.	Minimum temperature.	Mean temperature.	Rain-fall.
ILLINOIS—Cont'd.				°		°	°	*In.*
Springfield	Sangamon	G. M. Brinkerhoff	30	103	8	52	75.9	.....
Dubois	Washington	Wm. C. Spencer	24	95	12	44	72.7	4.49
Galesburg	Knox	Prof. Wm. Livingston	29	96	11	56	75.0	1.27
Manchester	Scott	Dr. J. and C. W. Grant	25	99	11	50	75.2	2.60
Mt. Sterling	Brown	Rev. A. Duncan	29, 30	95	.....	.....	82.7	.....
Andalusia	Rock Island	E. H. Bowman, M. D.	27	98	9, 13	52	72.0	.....
Augusta	Hancock	S. B. Mead, M. D	30	99	11	51	73.2	2.35
Warsaw	....do	B. Whitaker	30	100	11	53	72.2	2.89
Averages							72.7	1.99
WISCONSIN.								
Sturgeon Bay	Dove	Rufus M. Wright	24	94	10	49	69.1	2.20
Manitowoc	Manitowoc	Jacob Lüps	30	97	10	50	67.5	3.35
Hingham	Sheboygan	John De Lyser	30	103	11	46	69.1	.....
Milwaukee	Milwaukee	I. A. Lapham, LL.D	30	100	11	45	67.8	2.62
Geneva	Walworth	W. H. Whiting	24, 30	99	12	50	69.9	1.45
Embarrass	Waupacca	E. Everett Breed	24, 28, 30	96	8	48	68.7	3.05
Rocky Run	Columbia	W. W. Curtis	30	99	9	49	72.4	1.06
Madison	Dane	W. W. Daniels	30	98	10	52	71.3	1.92
Edgerton	Rock	H. J. Shints	30	102	8	52	74.6	3.50
Mosinee	Marathon	Jno. O'Donoghue	28	96	7	46	67.6	2.91
Baraboo	Sauk	M. C. Waite	26	102	4	56	77.1	1.88
New Lisbon	Juneau	J. L. Dungan	23	104	11	49	71.4	.....
Tunnel City	Monroe	Rev. Geo. Pegler	29, 30	100	7	44	70.4	.....
Bayfield	Bayfield	Andrew Tate	23	100	11	40	.....	.....
Averages							70.5	2.18
MINNESOTA.								
Afton	Washington	Dr. B. F. & Mrs. Babcock	29	99	7, 9	48	71.4	0.90
St. Paul	Ramsey	Rev. A. B. Paterson	29	99	9	49	75.4	0.79
Minneapolis	Hennepin	Wm. Cheney	29	96	7, 9	49	70.9	1.58
Sibley	Sibley	C. W. & C. E. Woodbury	27, 29	93	7	49	71.8	0.38
Koniska	McLeod	T. M. & M. H. Young	26, 28, 29	94	7, 8	44	67.4	0.50
New Ulm	Brown	Charles Roos	29	98	7	48	72.8	2.25
Madelia	Watonwan	W. W. Murphy	26	100	7	49	74.8	0.40
Averages							72.1	0.97
IOWA.								
Clinton	Clinton	Dr. J. P. Farnsworth	29	101	8, 9, 10, 11	50	70.2	2.75
Waukon	Allamakee	E. M. Hancock	29	96	8	46	69.5	.....
Monticello	Jones	Rufus P. Smith	27	102	9	35	72.4	1.60
Bowen's Prairie	....do	Sam'l Woodworth	23	98	7, 8, 9	48	71.3	1.50
Ft. Madison	Lee	Dan'l McCready	29, 30	100	10	52	76.0	1.12
Guttenberg	Clayton	Jas. P. Dickerson	30	103	8	48	71.2	.....
Mt. Vernon	Linn	Prof. A. Collins	30	98	7	48	70.6	.....
Iowa City	Johnson	Prof. Theo. S. Parvin	30	99	8, 11	50	71.8	1.30
Independence	Buchanan	Geo. Warne, M. D.	29	102	9	51	74.0	0.70
Near Independence	....do	Mrs. D. B. Wheaton	30	100	9	51	74.2	1.45
Waterloo	Black Hawk	T. Steed	30	102	4	43	72.5	1.20

Table showing the highest and the lowest range of the thermometer, &c.—Continued.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date.	Minimum temperature.	Mean temperature.	Rain-fall.
IOWA—Continued.				°		°	°	*In.*
Rockford	Floyd	H. Wadey	29	93	9, 10	54	73.0	.....
Algona	Kossuth	James H. Warren	26	94	11	50	70.2	.....
West Bend	Palo Alto	Ph. Dorweiler	29	95	6, 8	48	71.9	.....
Webster City	Hamilton	Clayton J. Croft	29	94	8	48	70.9	0.50
Boonesboro'	Boone	E. Babcock	23, 26, 27, 28	96	8	46	70.5	0.48
Grant City	Sac	Mr. and Mrs. Miller	27	102	8	51	74.4	0.77
Logan	Harrison	Jacob T. Stern	29	98	10	43	69.3	0.30
Woodbine	....do	David R. Witter	30	100	7, 8, 9	48	70.6	0.22
West Union	Fayette	Frank McClintock	30	101	8	53	73 4	1.03
Averages							71.9	1.07
MISSOURI.								
St. Louis University	St. Louis	Rev. F. H. Stuntebeck	30	94	9, 10	54	73.5	1.46
Allenton	....do	A. Fendler, M. D	29	99	11	51	71.9	4.88
Hematite	Jefferson	Jno. M. Smith	23	98	11	52	75.3	1.25
Hannibal	Ralls	Frank I. Hearne	30	98	10, 12	54	74.2	2.90
Rolla	Phelps	Homer Ruggles	30	96	11	51	73.9	2.73
Jefferson City	Cole	Nicolas de Wyl	30	97	10	54	75.8	.....
Kansas City	Jackson	Sam'l W. Salisbury	30	98	7, 9, 10	52	72.5	1.25
Harrisonville	Cass	John Christian	28	100	6, 7, 8, 9, 11, 12, 13	58	75.3	1.99
Oregon	Holt	Wm. Kaucher	29, 30	98	9	51	73.4	1.27
Averages							74.0	2.22
KANSAS.								
Atchison	Atchison	Dr. H. B. & Miss Horn	30	101	8	55	74.3	3.05
Leavenworth	Leavenworth	Dr. J. Stayman	30	102	12	53	73.6	1.95
Olathe	Johnson	Watts Beckwith	21	100	6	54	73.0	2.70
Paola	Miami	L. D. Walrath	30	99	8, 9, 10, 11, 12	56	73.8	1.00
Lawrence	Douglas	Prof. F. H. Snow	30	101	7, 8, 9, 10, 11	56	73.7	1.88
Holton	Jackson	James Watters, M. D	30	101	6	53	74.6	1.19
State Agr. College	Riley	Prof. B. F. Mudge	30	102	8, 9	55	74.6	0.79
Council Grove	Morris	A. Woodworth, M. D	30	100	12	52	76.6	2.50
Averages							74.3	1.88
NEBRASKA.								
De Soto	Washington	Charles Seltz	29	101	8	49	74.0	0.89
Bellevue	Sarpy	Mrs. E. E. Caldwell	29	96	8	53	74.2	2.10
New Castle	Dixon	Louis H. Smith	29	99	9	47	72.9	.....
Averages							73.7	1.50
UTAH TERRITORY.								
Great Salt Lake City	Great Salt Lake	W. W. Phelps	27	95	1, 2, 17	45	66.5	.....
Coalville	Summit	Thomas Bullock	25	93	4	42	65.2	.....

Table showing the highest and the lowest range of the thermometer, &c.—Continued.

State and station.	County.	Observer.	Date.	Maximum temperature.	Date.	Minimum temperature.	Mean temperature.	Rain-fall.
CALIFORNIA.				°		°	°	*In.*
Monterey	Monterey	C. A. Canfield, M. D.	4	81	2, 18	44	64.3	0.00
Cahto	Mendocino	A. W. Thornton, M. D.	6	95	29	50	66.7	0.02
Visalia	Tulare	James W. Blake	5, 10, 11	94	1	59	75.9	0.00
Averages							69.0	0.01
COLORADO TERRITORY.								
Denver	Arapahoe	Wm. N. Byers and S. T. Sopris.	29	94	3	48	68.2	0.52

STATE AVERAGES FOR JUNE, 1870.

Table of the maximum and minimum temperatures (with dates prefixed) in the several States, &c., named, with the average mean temperature and rain-fall in each, for the month of June, 1870.

States.	Date.	Maximum temperature.	Date.	Minimum temperature.	Average mean temperature.	Average rain-fall.
		°		°	°	*In.*
Maine	5	97	10	47	68.2	2.95
New Hampshire	25	100	21	48	69.1	3.25
Vermont	25	96	20, 21, 22	50	71.4	3.99
Massachusetts	25	104	10, 11	48	70.4	4.56
Connecticut	24, 25	95	11	52	71.6	4.46
New York	28	102	22	48	72.7	2.93
New Jersey	19	100	11	55	74.3	3.52
Pennsylvania	26, 27	98	21	47	72.5	4.65
Maryland	28	96	12	55	73.7	6.60
District of Columbia	28	93	2	63	75	4.45
Virginia	28	102	11	51	73.4	5.44
North Carolina	27	103	10, 14	52	74.5	4.41
South Carolina	26	95	12	60	76.8	6.24
Georgia	27	96	10, 11	51	75.5	3.27
Alabama	27	96	13	59	76.7	6.10
Florida	26, 27, 29, 30	98	10	65	79.9	6.94
Texas	5, 6, 15	100	9	64	81.0	2.71
Mississippi	28	103	12, 13	58	77.8	4.26
Tennessee	26, 27	94	11	53	71.8	9.19
Kentucky	24, 25	94	10	52	72.8	4.04
Ohio	26, 28	102	22	48	71.9	3.86
Michigan	25	106	9, 10	41	68.8	3.58
Indiana	24, 25	100	10	51	72.9	4.09
Illinois	28	105	12, 15	44	72.7	1.99
Wisconsin	23	104	11	40	70.5	2.18
Minnesota	26	100	7, 8	44	72.1	0.97
Iowa	30	103	9	35	71.9	1.07
Missouri	28	100	9, 11	51	74.0	2.22
Kansas	30	106	12	52	74.3	1.88
Nebraska	29	101	9	47	73.7	1.50
California	6	95	2, 18	44	69.0	0.01

NOTES OF THE WEATHER, JUNE, 1870.

Orono, Me.—Aurora 18th; damaging thunder-storm 20th.

Surrey, Me.—Two thunder-storms, one with hail, 20th.

West Waterville, Me.—Haying 26th—in 1869, July 6. Mean heat 3.79° higher than the June average of six years; moisture 2.03 inches less.

Gardiner, Me.—Auroras 16th, 18th; severe hail 20th. Month dry, and mean heat 2.04° above June average of thirty-four years; moisture 1.5 inch less.

Lisbon, Me.—Refreshing rains 7th to 12th; strawberries 15th; haying 28th; rain needed 30th.

Norway, Me.—Hottest and driest June I ever knew.

Cornish, Me.—Fireflies 1st; strawberries 3d; raspberries 22d.

Cornishville, Me.—Showers, much thunder, 20th. June average of forty years, 61°; warmest, 1831, 69°; this, 71°.

Whitefield, N. H.—Rain on eighteen days, but ground dry till 30th.

Tamworth, N. H.—Fireflies 2d; aurora 3d; ripe strawberries 14th; drought 30th.

Goffstown, N. H.—A moist, hot month; rain on twelve days.

Lunenburg, Vt.—Ripe strawberries 15th; raspberries 28th; hail 18th, 20th. June dry, but crops forward and looking well.

Stratford, Vt.—June dry, and warmest in twelve years.

North Craftsbury, Vt.—Severe thunder-storm, hail ten miles south, 20th; slight frost in places 21st. Warmest June in many years.

Newport, Vt.—Auroras 3d, 14th, 24th; thunder-showers on ten days.

East Bethel, Vt.—Fireflies 4th; refreshing rains 6th, 7th; corn tassels 20th. Thermometer above 80° on twenty-one days, and 90° and above on ten days.

Woodstock, Vt.—Thunder-storms 20th, 27th. June warm, but not dry.

West Charlotte, Vt.—Auroras 3d, 19th, 26th; first thunder-shower of the season (and first rain since May 17) 6th. Season two weeks early.

Panton, Vt.—Ripe strawberries 11th; raspberries 29th; thunder-showers, hail, 20th.

Castleton, Vt.—Ripe strawberries 5th; showers, with hail, 20th.

Milton, Mass.—Thunder-storm of twelve hours, extending over New England, 20th. Last quarter of June very warm.

Cambridge, Mass.—Severe thunder-storm, with torrents of rain, 20th. (It was severer, and with hail, in Boston and vicinity.)

North Billerica, Mass.—Ripe strawberries 18th. Much lightning and thunder in June; vegetation rank; streams full.

New Bedford, Mass.—Althea blossoms 6th, locust 16th, tulip poplar 18th, chestnut 30th; severe and protracted thunder-storm 20th.

Lunenburg, Mass.—Warmest June on record; mean 71.01°; in 1865, 70.29°; in 1869, 65.71°. Average for thirty-one years, 66.24°.

Amherst, Mass.—Warmest June on college record—thirty-five years.

Richmond, Mass.—Violent thunder-storms, with hail, 17th, 20th, and 30th. Month hot, sultry, with frequent thunder-showers.

Hinsdale, Mass.—Heavy thunder storm, large damaging hail, 20th.

Newport, R. I.—Dense fogs till 20th. Season two weeks earlier than last year.

Columbia, Conn.—Terrific thunder and hail storm 20th; fearful and damaging gale 27th.

Brookfield, Conn.—Severe storm (hail) 20th; further north hail very severe. Last of June was hot and very dry.

Moriches, N. Y.—Incessant lightning NNE. and NW. (no rain) 20th.

Hartford, N. Y.—June unusually dry; much distant thunder.

Garrison's, N. Y.—Heavy thunder-storm 20th. Last of month very warm.

New York City.—Aurora 18th; meteors 18th, 25th, 30th; heavy thunder-storms 20th, 27th.

Newburg, N. Y.—Thermometer 90° oftener than in any June for years.

Cooperstown, N. Y.—Brilliant aurora 18th; warmest June in twenty years.

North Hammond, N. Y.—Aurora 18th. Except 1st and 30th, very hot, and crops injured by drought—the severest ever known at this season.

Cazenovia, N. Y.—Aurora 6th; thunder-storms 9th, 20th.

Depauville, N. Y.—Copious thunder-shower 9th; auroras 15th, 16th, 18th, 19th, 26th, 27th. Driest May and June in thirty-nine years. June 5.3° warmer than June average of six years; and 11.4° warmer than in 1869.

North Volney, N. Y.—Fireflies 2d; auroras 16th, 17th, 18th, 19th. Very dry.

Newark Valley, N. Y.—Hail 17th, and one mile north 20th.

Himrods, N. Y.—Severe thunder-storm, settled rain. 9th; aurora 18th; very heavy thunder-storm, with hail, in Penn Yan 27th. Warmest June since 1865.

Buffalo, N. Y.—Ripe strawberries 8th; destructive thunder and hail storm 11th; grapes blossomed 15th; cherries abundant after 20th.

Newark, N. J.—Fireflies 19th; severe thunder and lightning, little rain, 20th. Average mean temperature of twenty-six Junes, 66.997°: highest, 1865, 71.72°; lowest, 1843, 60.25°; this, 72.345°, with rain above average.

New Germantown, N. J.—Aurora 18th; heavy thunder-storm, hail, 20th.

Greenwich, N. J.—Damp affects wheat 11th; haying 17th to 24th, without rain: wheat cut 27th; locusts heard 30th.

Vineland, N. J.—Wet and damp till 16th; dry and drought till 29th.

Hamlinton, Pa.—Heavy thunder-storm 17th; aurora 18th.

Dyberry, Pa.—Streams full 13th; low 30th. Hot and dry.

Fallsington, Pa.—Rain, damp, fog to 17th. Warmest June since 1858.

Horsham, Pa.—To 15th cool and damp; 19th to 29th good harvest weather.

Plymouth Meeting, Pa.—Daily rains from May 27th to June 8, and on seventeen days in June, yet latter half of June was dry; east winds on seventeen mornings ending 11th: hay cut 20th, wheat 30th. Month 3.7° above June average of six years.

White Hall, Pa.—Heavy and damaging thunder and hail storm 20th.

Reading, Pa.—Thunder-storms, with hail, 20th, with gale 27th.

West Chester, Pa.—Haying began 20th, (heavy grass:) oats heading 21st.

Ephrata, Pa.—Rain, mist, fog to 8th; warm; many showers to close.

Carlisle, Pa.—Haying, first rainless day since May 22d, 17th: wheat cut on slate lands 27th.

Tioga, Pa.—Last copious rain 11th; hot and dry since.

Grampian Hills, Pa.—Clover cut 22d; oats heading 27th: dry 20th to 26th.

Beaver, Pa.—Scarcely a fair day till 17th, and latter part wet.

Emmittsburg, Md.—Many showers early in June; later, dry and warm.

Hampton, Va.—After 15th very fine; last week very hot.

Surry C. H., Va.—Locust heard 20th; getting dry 30th. June fair, calm, and very hot 24th to 30th; rain on thirteen days.

Piedmont, Va.—Fireflies 2d; harvest 24th; wheat scabby.

Lynchburg, Va.—To 13th, five inches rain; after, half an inch.

Snowville, Va.—Thunder and hail storms 2d, 7th; wheat cut 20th.

Wytheville, Va.—Growing month; rain on twenty days; crops good.

Goldsboro, N. C.—Neuse River freshet destroyed much cotton 26th; cotton blooms 27th. Thermometer 100° and above on five days ending 30th.

Gowdeysville, S. C.—Early wheat cut 2d; clear and dry 20th to close.

Bluffton, S. C.—Quite rainy, and cotton not in bloom till 20th.

Berne, Ga.—First copious rain since April 1st, 12th; terrific thunder storm, with a southwest gale, 20th.

Pilatka, Fla.—Destructive thunder-storm and gale, with hail larger than hens' eggs, 6th; from 22d to close, dry, hot, and sultry.

Ocala, Fla.—Refreshing rains on 5th to 20th saved crops; severest thunder-storm, with wind and hail, ever known here 29th.

Chattahoochie, Fla.—Last of June rainy and much heavy thunder.

Oakland, Tex.—Rains have benefited corn, but injured cotton.

Lavaca, Tex.—Watermelons 16th. Driest June since 1858; cracks in the baked soil three to four feet deep.

Austin, Tex.—Unusually moist air and many showers in June.

Cheneyville, La.—Heavy thunder-storm, with hail and gale, 11th.

Columbus, Miss.—Cotton blooms 18th; wheat harvested; average crop.

Enterprise, Miss.—Katydids 27th. Rains heavy but local.

Brookhaven, Miss.—May unusually dry; little thunder in June. Blackberries, 2d; katydids, 21st; no night rains; little wind; hot and dry; vegetation needs rain.

Elizabethton, Tenn.—Severest rain and hail storm known here 26th; entire month cloudy, with immense rainfall and floods.

Clarksville, Tenn.—Thunder-shower, hail, 23d; a moist month.

Trenton, Tenn.—Hail half an inch deep, 10th; some cotton fields ruined.

Pine Grove, Ky.—Thunder-storm, hail, 15th; rain on sixteen days, light.

Shelby City, Ky.—Showers, with hail, 8th, 10th; excessive rains to 14th, lodging grain and grass.

Wooster, Ohio.—More rainy days than in any June for many years.

Kelley's Island, Ohio.—Black locust blossoms, 1st; Isabella grape, 11th; Catawba, 17th. Month 4.57° warmer than the June average of eleven years.

Sandusky, Ohio.—Isabella and Catawba grapes blossom 9th.

Westerville, Ohio.—Thunder-shower ends a long drought 7th.

North Bass Island, Ohio.—Catawba grapes blossom 10th, 17th.

Toledo, Ohio.—Highest heat ever known here in June.

Kenton, Ohio.—Three thunder-storms united here, with high winds, doing much damage, 28th. A very hot month.

Urbana, Ohio.—Wheat harvest began 24th. The month not one degree above the June average of eighteen years.

Bethel, Ohio.—Great rain, thunder, 9th; thunder shower, hail, 11th.

Jacksonburg, Ohio.—Fall barley cut 3d to 10th; winter wheat 22d to 30th.

Cincinnati, Ohio.—Thunder, heavy shower, some hail, 13th; thunder shower, two inches of rain fell in twenty to thirty minutes, 29th.

Detroit, Mich.—Heavy thunder-shower and gale, 28th.

Grand Rapids, Mich.—June 8° warmer than last year, and 3° higher than in 1868; the hottest June remembered here.

Ontonagon, Mich.—To 24th driest June in many years; crops suffered much, but rain of 24th, 25th will refresh late crops.

Vevay, Ind.—Catalpa blossoms 6th; ailanthus 13th; barley cut 13th; wheat 23d; hay 27th; terrific thunder and lightning, copious rain, 29th.

Knightstown, Ind.—To 15th showery; to 25th very dry; rain 26th.

Rensselaer, Ind.—Last week very hot, with some heavy showers.

Marengo, Ill.—Drought of forty-three days relieved by heavy showers 9th.

Aurora, Ill.—Aurora, 20th; thunder shower, hail, 25th; drought severe; Fox River lower than in twenty-three years or more.

Belvidere, Ill.—Beautiful aurora 15th; great heat and drought; rainfall from April 1st to June 30th, 2.33 inches; for same period in 1869, 16.90 inches.

Ottawa, Ill.—Severe thunder-storm 29th, 30th—killed one person; thermometer above 100° on six days.

Winnebago, Ill.—Brilliant aurora 17th; rains have been local for three or four months, unequally distributed; some sections had but little.

Wyanot, Ill.—Much hazy air; last week the hottest in twenty-five years.

Hennepin, Ill.—April and May were dry and warm, but June excels; in forty-two years only one June reached 96°; this June reached 100° on five days.—(*S.*) Thermometer 100° and upward on seven days.—(*O.*)

Dubois, Ill.—Hail 9th, 12th; month 2.40° above average of six years.

Hingham, Wis.—Clover blossoms 1st; barley heading 12th; spring wheat 20th.

Rocky Run, Wis.—Last eight days warmest known here; crops failing.

Baraboo, Wis.—Thermometer 100° and more on the last seven days.

Minneapolis, Minn.—Green peas 1st; haying 23d; hottest June since 1858.

New Ulm, Minn.—Aurora, 20th; last of month very hot.

Clinton, Iowa.—Thunder-storm, hail, 4th; drought; last fortnight the warmest in seven years.

Waukon, Iowa.—Faint auroras, 18th, 19th; heat and drought.

Fort Madison, Iowa.—Dry season and dry month; since 1848 only once (June 19, 1854) did June reach 100° till now.

Iowa City, Iowa.—Average June heat for thirty years 67.92°; this, 71.81°.

Waterloo, Iowa.—Slight frost 8th; great heat and drought 30th.

Algona, Iowa.—Hottest June ever known in this county.

Woodbine, Iowa.—Hail 2d, with thunder-shower 5th; drought 30th.

West Union, Iowa.—Thunder-storm, hail, wind 5th; aurora 15th.

Hematite, Mo.—Driest June in many years; crops failing.

Oregon, Mo.—Auroras 17th, 18th, 20th, 23d, 24th, 30th.

Lawrence, Kas.—Very comfortable to 19th; since, 90° and above daily.

Council Grove, Kas.—Greatest heat in June in nine years.

Bellevue, Neb.—Hail, ground white, 4th, slight 5th. Month 4.6° warmer than in 1869.

New Castle, Neb.—No rain for four weeks; crops suffering.

Coalville, Utah.—Grasshoppers eating up all vegetation to 10th, then filling the air in clouds to 24th. It is said that along Salt Lake there is a windrow of them three or four rods wide and three to four feet deep.